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THE NYCTAGINACEAE AND CHENOPODIACEAE OF NORTHWESTERN SOUTH AMERICA

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Paul C. Standley

In connection with the preparation of an account of the Nyctaginaceae of Peru for the flora of that country now almost ready for publication, it was found that the task would be but little greater if all the plants of the family occurring in northwestern South America were treated, hence the present paper. The area covered embraces Bolivia, Ecuador, Colombia, and Venezuela, but most of the species known from the Guianas also are included.

This account of the South American Nyctaginaceae makes no pretension to being a monograph, but is rather a preliminary treatment intended to facilitate the determination of current material received for study. The collections available are altogether inadequate to permit the study of specific variations, in which the family is notoriously prolific.

I know of few groups of plants in which specific differences are so unstable and so baffling. In most of the genera, but particularly in *Neea*, *Torrubia*, and *Mirabilis*, no single character seems to be constant. The natural tendency, with a relatively small series of specimens, is to accord specific rank to each fairly well-marked form; yet long experience with the same family, as it is represented in the United States, indicates that more ample material will prove that some of these forms now isolated will be connected by other intergrading ones. Because of the vagueness of specific limits in such genera as *Torrubia* and *Bougainvillea*, it has been impracticable to prepare satisfactory keys for separating the species, and it is doubtful whether it ever will be possible to compile readily usable keys for them.

The only important genus of the family, as it is represented in South America, whose species may be recognized by really clear-cut characters, is *Boerhaavia*. In Mexico and the southwestern United States, however, the species of the same genus intergrade in quite as tantalizing a manner as those of *Mirabilis*.

There is little reason for expecting that the list of species published here will be greatly increased by further exploration, because most of the species already known are rather widely distributed. Very

extensive collections made recently in Peru have contained only two clearly valid new species of the family. A few additional species in *Torrubia* and *Neea* may be discovered in regions still unexplored.

The study whose results are presented on the following pages is based primarily on the collections in the Herbarium of Field Museum (indicated by the letter F in parenthesis). These are rich in photographs or fragments of types and otherwise authentic material from the Berlin herbarium, the photographs having been obtained by Assistant Curator J. Francis Macbride, with the assistance of a fund provided for the purpose by the Rockefeller Foundation. The material includes some representation of almost every species reported from South America, and it has been possible to consider most of the species described from Brazil, Paraguay, and Argentina.

The work has been greatly facilitated by the loan of all the material of the Nyctaginaceae from the area under consideration in the United States National Museum (W). To Dr. William R. Maxon and Mr. Ellsworth P. Killip the writer is deeply indebted for the opportunity of examining this collection, which is particularly valuable for its numerous Venezuelan specimens.

KEY TO THE GENERA

Embryo straight; flowers mostly unisexual; trees or shrubs, sometimes armed with spines; leaves all or mostly opposite or verticillate (*Pisonieae*).

Stamens included; anthocarp without stipitate glands.

Stamens 5–10; limb of the staminate perianth little or not at all broader than the tube.....1. *Neea.*

Stamens 25–30; limb of the staminate perianth much broader than the tube.....2. *Cephalotomandra.*

Stamens exserted.

Anthocarp fleshy, juicy, without glands; flowers cymose-paniculate, unisexual; stems unarmed.....3. *Torrubia.*

Anthocarp dry, coriaceous, bearing numerous stipitate glands.

Flowers unisexual, in cymes; stigma penicillate; stems often armed with spines.....4. *Pisonia.*

Flowers perfect, in umbels; stigma depressed-capitate; stems unarmed.....5. *Pisoniella.*

Embryo curved; flowers perfect; chiefly herbaceous plants, sometimes woody and then often scandent; leaves opposite or alternate.

Leaves alternate.

Perianth unchanged in fruit; flowers free from the bracts; plants herbaceous or nearly so (*Salpiantheae*)....6. *Salpianthus.*

Perianth much altered in fruit, the lower part enlarged and adherent to the fruit; flowers borne in clusters of 3, each flower adnate to a large colored bract; plants scandent or erect, woody, usually armed with spines (*Bougainvilleae*). 7. *Bougainvillea.*

Leaves opposite.

Perianth lobes valvate. Plants large, sometimes scandent, the leaves often verticillate; flowers minute, umbellate, not involucrate (*Colignonieae*).....8. *Colignonia.*

Perianth lobes induplicate-valvate (*Mirabileae*).

Anthocarp lenticular, with recurved, usually dentate margins; flowers in 3's, subtended by a 3-parted involucre. 9. *Allionia.*

Anthocarp terete or angled, never margined.

Flowers subtended by distinct bracts.....10. *Boerhaavia.*

Flowers subtended by a gamophyllous involucre. 11. *Mirabilis.*

1. NEEA R. & P.

Shrubs or trees; leaves opposite or verticillate, rarely alternate, petiolate, entire, coriaceous to membranaceous; flowers unisexual and usually dioecious, small, white, reddish, or green, sessile or pedicellate, commonly tribracteolate at the base, arranged in lateral, axillary, or terminal cymes, rarely solitary; staminate perianth urceolate, globose, or tubular, shortly 4–5-dentate; stamens 5–10, included, the filaments unequal; pistillate perianth urceolate or tubular, constricted above the ovary, often contracted at the mouth; stigma penicillate; anthocarp narrowly or broadly ellipsoid, crowned by the persistent free portion of the perianth.

In this, the largest South American genus of the family, the species are poorly understood, largely because of the lack of ample material. Of some species only staminate branches are known, and of others only pistillate specimens. In most genera of the Nyctaginaceae the species are poorly marked, but in *Neea* it is very difficult indeed to differentiate them satisfactorily. Only a few species are listed here, but a large number have been described from the Amazon Valley of Peru and Brazil. It is probable that many more species are to be found in the wet forests of Bolivia and Colombia, for the

parts of those countries in which they may be expected still are practically unknown botanically. It is noteworthy that no species of *Neea* is reported from Ecuador, although several must occur there, at least on the eastern slopes of the Andes.

Leaves rounded at the apex, firm-coriaceous, closely reddish-tomentulose beneath.....1. *N. obovata.*

Leaves acute or acuminate, comparatively thin.

Leaves permanently tomentose or pilose beneath.

Leaves small, 2.5–4.5 cm. wide. Staminate inflorescence few-flowered, the peduncle long and slender....2. *N. Bangii.*

Leaves large, 6–15 cm. wide.

Petioles short, 2 cm. long or less.....3. *N. Woronovii.*

Petioles elongate, 4–4.5 cm. long.....4. *N. mapirensis.*

Leaves glabrous beneath at maturity or nearly so.

Inflorescence short-pedunculate, dense, few-flowered, erect.

Leaves green when dried, 6.5–9 cm. wide.

5. *N. dimorphophylla.*

Leaves fuscous when dried.

Inflorescence small, commonly 2–5.5 cm. broad.

Inflorescence densely ferruginous-puberulent or tomentulose.....6. *N. divaricata.*

Inflorescence sparsely ferruginous-puberulent.

7. *N. constrictoides.*

Inflorescence large, 10 cm. broad.....8. *N. Brittonii.*

Inflorescence long-pedunculate, lax, usually many-flowered, commonly pendent.

Leaves fuscous when dried; inflorescence few-flowered.

9. *N. longipedunculata.*

Leaves green when dried; inflorescence many-flowered.

Staminate flowers tubular, more than twice as long as broad.

10. *N. boliviana.*

Staminate flowers urceolate, less than twice as long as broad.

11. *N. anisophylla.*

The key here presented for the separation of the species is a most unsatisfactory one, chiefly on account of the absence of complete material, and because no specimens at all are available for two of the species. Those reported from Bolivia seem to be distinct enough from one another, and it is to be presumed that they are distinct from *N. constrictoides*, on geographic grounds if for no other reason.

Except in one instance, the Bolivian specimens seem to be different from the numerous species known from Peru.

1. **Neea obovata** Spruce ex Heimerl, Beitr. Syst. Nyctag. 38. 1897.

Young branchlets densely reddish-puberulent; leaves opposite, firmly coriaceous, the stout petioles 5–25 mm. long, very densely puberulent; leaf blades obovate or elliptic-obovate, 6–11 cm. long, 3–6.5 cm. wide, broadly rounded at the apex, acute or acutish at the base, when young very densely reddish-puberulent or strigose on both surfaces but in age glabrate, at least above; inflorescence erect, pedunculate, open, corymbiform or paniculate, many-flowered, the branches spreading or ascending, the flowers congested at the ends of the branches; perianth subcampanulate, 3 mm. long, reddish-tomentulose or finally glabrate; stamens 6.

Venezuela: San Carlos on the Río Negro, 1853–54, *Spruce 3128* (F, photo. of type ex herb. Berol.). Ad flum. Guainia vel Río Negro supra ostiam fluminis Casiquiare, in 1854, *Spruce* (W).

The species should be enumerated also for the flora of Colombia, since the type locality is on the boundary between that country and Colombia. This happens to be one of the few easily recognizable and well-marked species of the genus, because of its thick leaves, broadly rounded at the apex, and covered beneath with a minute, bright reddish tomentum.

2. **Neea Bangii** Rusby, Bull. N. Y. Bot. Gard. 4: 435. 1907.

A tree 4.5–6 m. high, the young branchlets ferruginous-tomentulose; leaves opposite or ternate, unequal, rather thin, blackish when dried, the slender petioles 3–8 mm. long, tomentulose or hirtulous; leaf blades elliptic-oblong or mostly oblong-obovate, 6–11 cm. long, 2.5–4.5 cm. wide, abruptly acute or short-acuminate with obtuse tip, slightly lustrous above and minutely appressed-pilosulous or glabrate, beneath sparsely and persistently pilosulous with lax spreading brownish hairs; pistillate cymes few-flowered, 2–4 cm. broad, on very slender, sparsely villosulous peduncles 3–5 cm. long, probably pendent, lax, the bractlets triangular-subulate, 1 mm. long; perianth yellowish, urceolate, 4 mm. long, sparsely ferruginous-tomentulose, especially near the base; fruit black, oval, nearly 15 mm. long and half as thick.

Bolivia: At the foot of Mount Uchimachi, Calapampa, July, 1894, *Bang 2346* (F, W, type collection). Without locality, *Bang 2306* (W). Tumapasa, *Williams 585* (W).

3. **Neea Woronovii,** sp. nov.—Ramuli crassiusculi subdense adpresse ferrugineo-tomentulosi, internodiis usque ad 10 cm. longis; folia opposita vel ternata inaequalia tenuiter coriacea, petiolo crassiusculo 1–1.6 cm. longo dense ferrugineo-tomentuloso; lamina ob-

longa vel obovato-oblonga 13–25 cm. longa 5.5–8 cm. lata abrupte acuminata, basi acuta vel attenuata, supra lucida, in sicco fusca, glabra vel glabrata, costa prominula, nervis vix elevatis, subtus paullo pallidior, ubique minute ferrugineo-hirtula, ad nervos breviter villosula, costa gracili elevata, nervis lateralibus utroque latere c. 11, aliis paullo tenuioribus interjectis, gracilibus, prominentibus, arcuatis, remote a margine conjunctis, nervulis prominulis paucis laxissime reticulatis; inflorescentia feminea axillaris magna laxissime multiflora c. 13 cm. longa et 15 cm. lata, recurva vel pendula, c. 6.5 cm. longe pedunculata, pedunculo ut rami densissime ferrugineo-tomentuloso, ramis gracilibus alternis oppositis vel subverticillatis supra late dichotomis, floribus ad apices ramulorum dense congestis sessilibus; bracteolae subulatae 1.5–2 mm. longae dense ferrugineo-tomentulosae; perianthium valde juvenile c. 2 mm. longum ovato-oblongum acutiusculum densissime tomentulosum.—Colombia: Chingale, Dept. Santander, April 18, 1926, *G. Woronow and S. Juzepczuk 4320* (Herb. Field Mus. No. 605,666, type).

The plant is noteworthy for its long, large, and copiously pubescent leaves, and for the very large and many-flowered inflorescence, covered with a dense reddish tomentum.

4. **Neea mapirensis,** sp. nov.—Ramuli puberuli vel glabrati; folia opposita, petiolo crassiusculo 4–4.5 cm. longo hirtulo vel glabrato; lamina crasse membranacea magna anguste elliptico-oblonga c. 36 cm. longa et 13–15 cm. lata, acuminata, basi acuta vel obtusiuscula, in sicco subfusca, supra glabra vel glabrata, sublucida, costa venisque parum prominulis, subtus paullo pallidior, ubique subdense hirtula vel asperulo-puberula, costa crassiuscula prominente, nervis lateralibus utroque latere c. 13 gracilibus prominentibus subarcuatis angulo c. semirecto adscendentibus remote a margine conjunctis, nervulis paucis laxissime reticulatis parum conspicuis; inflorescentia feminea cymosa breviter pedunculata pauciflora c. 5 cm. longa et ut videtur duplo latior, ramis incrassatis glabratis, floribus sessilibus vel crasse pedicellatis, bracteolis deciduis; anthocarpium oblongum glabrum 1 cm. longum 5 mm. latum basi obtusum apice calyce persistente minuto coronatum.—Bolivia: San Antonio near Mapiri, alt. 850 m., December, 1907, *Otto Buchtien 1993* (U. S. Nat. Herb. No. 1,398,045, type).

Although the plant is known only from too fragmentary material —two leaves and a detached inflorescence—it seems clearly distinct from all other species of the genus, especially in its very large leaves with copious pubescence. The leaves are somewhat broader than those of *N. Woronovii*, which differs also in having slender branches in the inflorescence.

5. **Neea dimorphophylla,** sp. nov.—Ramuli graciles subteretes viridescentes, novellis sparse hirsutis cito glabratis, internodiis brevibus vel elongatis; folia ternata vel quaterna, interdum opposita,

valde inaequalia, petiolo 5–10 mm. longo gracili hirtello vel glabrato; lamina crasse membranacea, foliorum majorum oblongo-elliptica vel ovata, rare obovata, prope medium latissima, 11–21 cm. longa, 5–9 cm. lata, abrupte acuta vel acuminata, basi acuta vel abrupte contracta et valde inaequalis, in sicco olivaceo-viridis, glabra, supra vix lucida, costa prominente, venis prominulis et plus minusve reticulatis, subtus paullo pallidior, interdum ad costam prominentem sparse pilosa, nervis lateralibus utroque latere c. 10 gracilibus prominentibus angulo lato adscendentibus prope marginem conjunctis, nervulis prominulis et arcte reticulatis; lamina foliorum minorum rotundata vel ovato-rotundata 3.5–6.5 cm. longa et aequilata, apice rotundata et abrupte apiculata, basi rotundata; inflorescentiae femineae axillares et terminales crasse 1.5–3 cm. longe pedunculatae erectae sublaxe pauciflorae, ramis crassiusculis sparse puberulis et pilosis subopppositis, floribus sessilibus et solitariis vel pedicellis valde incrassatis stipatis, bracteolis persistentibus subulatis vix 1 mm. longis sparse pilosulis; anthocarpium oblongum 8–9 mm. longum 4 mm. latum glabrum basin versus obtusum paullo angustatum, apice parte superiore calycis persistente coronatum; stylus breviter exsertus, stigmate penicillato.—Bolivia: Junction of the rivers Beni and Madre de Dios, August, 1886, *H. H. Rusby 2575* (Herb. Field Mus. No. 164,490, type; duplicate in U. S. Nat. Herb.).

In its foliage the Bolivian plant resembles *Neea laxa* Poepp. & Endl., of Peru, but the latter has a conspicuously different inflorescence.

6. **Neea divaricata** Poepp. & Endl. Nov. Gen. & Sp. 2: 45. 1838.

A medium-sized tree with dark green foliage, the branchlets glabrous or sparsely puberulent when young; leaves chiefly opposite, short-petiolate, subcoriaceous, oblong to oblong-elliptic, mostly 8–16 cm. long and 3–7 cm. wide, fuscous when dried, abruptly acute or short-acuminate with obtuse tip, glabrous or nearly so; inflorescences cymose-paniculate, erect, short-pedunculate, usually small and dense, with opposite or alternate branches, the branches sparsely or densely puberulent or glabrate; bractlets lance-subulate, 1–1.5 mm. long, puberulent or glabrate; flowers green, congested; pistillate perianth oblong-urceolate, 2.5–3 mm. long, sparsely ferruginous-puberulent, the limb minutely 5-dentate; stamens 5; anthocarp oblong, glabrous, 8–10 mm. long, obtuse at the base.

Bolivia: Forests of Buenavista, Dept. Santa Cruz, 450 m., *Steinbach 6443* (F). Also in Peru.

There is in the Herbarium of Field Museum a photograph and fragment of *Buchtien 1765* from Bolivia, received from the Berlin herbarium, which, so far as I can tell from the available material, may well be referable to this species, although it is indicated by Heimerl as the type of a new species.

Steinbach gives the vernacular name as "ajillo," and states that ashes obtained by burning the wood are employed for making lye that is used in the preparation of soap.

7. **Neea constrictoides** Heimerl, Beitr. Syst. Nyctag. 37. 1897.

Branchlets glabrous; leaves short-petiolate, the petiole 8 mm. long, the blades oblong-elliptic, 10–14 cm. long, 4–5.5 cm. wide, acuminate, with obtuse tip, cuneate at the base or attenuate to the petiole, glabrous, slightly lustrous above; inflorescences pedunculate, laxly flowered, broadly pyramidal, the branches opposite, sparsely ferruginous-puberulent, the flowers aggregate; pistillate perianth subcylindric, 6.5 mm. long, the teeth minute, acutish; immature fruit oblong-ellipsoid.

Colombia: Villavicencio, Bogotá, *Karsten.*

The plant is known to the writer only from the original description.

8. **Neea Brittonii,** nom. nov. *Neea macrophylla* Britton ex Rusby, Bull. Torrey Club 27: 126. 1900, non Poepp. & Endl. 1838.

Glabrous, drying blackish; petioles very stout, 1–2 cm. long; leaf blades oval, 15–20 cm. long, 7.5–10 cm. wide, short-acuminate, with acute tip, abruptly narrowed to the petiole, membranaceous, the veins 12–16 pairs; cymes 10 cm. broad, on a short stout peduncle, the branches minutely ferruginous-puberulent, stout, the flowers subsessile, rather densely clustered; bractlets lance-linear, 1–2 mm. long; staminate perianth almost 1 cm. long, 3–4 mm. broad, the 5 lobes 1 mm. long, ovate, obtuse; stamens 8, the longest less than half as long as the perianth.

Bolivia: Type collected at the junction of the rivers Beni and Madre de Dios, August, 1886, *H. H. Rusby 2119.* A specimen collected by Pearce at Monterrico also is referred by Britton to the species, of which I have seen no material.

9. **Neea longipedunculata** Britton ex Rusby, Bull. Torrey Club 27: 126. 1900.

A shrub or small tree 4 m. high with slender branches, the young branchlets ferruginous-tomentose, soon glabrate; petioles slender, 3–14 mm. long, sparsely pilose or glabrous; leaf blades fuscous when dried, thick-membranaceous, elliptic-oblong or ovate-oblong, broadest at or below the middle, 8–15 cm. long, 3.5–6 cm. wide, acuminate or long-acuminate, obtuse or narrowly rounded at the base, glabrous, the veins about 13 pairs; pistillate inflorescences small and few-flowered, on filiform pendent glabrous peduncles 5–15 cm. long, 2–6 cm. broad, lax, the slender branches densely ferruginous-tomentulose; bractlets subulate, 1 mm. long or less, ferruginous-tomentulose; perianth tubular, 1 cm. long, sparsely tomentulose or glabrate, 3 mm. wide, the lobes 2 mm. long, subrecurved.

Bolivia: Reis, 450 m., June, 1886, *Rusby 2709* (F, W, type collection). Charopampa, near Mapiri, edge of forest, 570 m., *Buchtien 1627* (W).

The original description is erroneous in several particulars, especially in describing the leaves as obovate.

10. **Neea boliviana,** sp. nov.—Ramuli crassi teretes ochracei, internodiis elongatis glabris; folia opposita magna subcoriacea in sicco laete viridia, petiolo 12–18 mm. longo glabro; lamina oblongo-elliptica vel obovato-elliptica, prope medium latissima, 15–26 cm. longa, 7.5–12 cm. lata, subabrupte acuminata vel acuta, acumine ipso obtuso, basi acutiuscula vel abrupte breviterque contracta, glabra, supra opaca, costa prominula, venis inconspicuis, subtus parum pallidior, costa gracili elevata, nervis lateralibus utroque latere c. 13 angulo fere recto abeuntibus leviter arcuatis gracilibus prominulis, nervulis vix prominulis paucis laxissime reticulatis; inflorescentiae masculae terminales et axillares 4 cm. longe pedunculatae cymoso-paniculatae, c. 8 cm. longae et aequilatae vel latiores, ramis alternis vel suboppositis crassiusculis sparse minute tomentulosis vel glabratis, floribus sessilibus vel brevissime crasse pedicellatis aggregatis, bracteolis ovato-oblongis dense ferrugineo-tomentulosis vix 1 mm. longis; perianthium tubulosum 7–8 mm. longum sparse ferrugineo-puberulum vel glabratum versus basin sensim angustatum sub orem paullo contractum et 2.5 mm. latum, dentibus minutis late triangularibus vix 1 mm. longis erectis.—Bolivia: Antahuacana, valley of the Río Espíritu Santo about 160 km. northeast of Cochabamba, alt. 750 m., June, 1909, *Otto Buchtien 4732* (U. S. Nat. Herb. No. 1,398,053, type).

Well marked by the large and broad, bright green, glabrous leaves, and by the ample, many-flowered inflorescence.

11. **Neea anisophylla** Ernst, Flora 57: 215. 1874. *N. Wiesneri* Heimerl, Bot. Jahrb. Engl. 11: 89. *pl. 2, f. 5.* 1889.

A shrub or small tree, usually 3 m. high or less, glabrous throughout or nearly so; leaves thick-membranaceous, opposite, bright green when dried, short-petiolate, the slender or stout petiole 2–10 mm. long; leaf blades elliptic-lanceolate or oblong-lanceolate, sometimes ovate-lanceolate, 6–23 cm. long, 2.5–9 cm. wide, usually acuminate or long-acuminate, often merely acute, usually strongly oblique and acute at the base; inflorescences very lax, many-flowered, on long slender filiform peduncles, pendent, corymbiform, the flowers pedicellate or sessile and glomerate, the bractlets minute; staminate perianth broadly urceolate, yellow, yellowish white, or green, 5–5.5 mm. long, glabrous or nearly so; stamens 6–8; pistillate perianth ovoid-tubular, 4.5–5 mm. long; anthocarp ellipsoid, glabrous, 6–7 mm. long.

Venezuela: Type from Catuche, Caracas, *Ernst.* Chacaito Gorge, near Caracas, 800–1,000 m., in forest, *Pittier 9476* (W). La Guaira, *Moritz 1464* (F, photo. and fragm. ex herb. Berol.; W). Bosque de Catuche, above Caracas, 1,200–1,800 m., *Pittier 6298* (F, W). Curucutí, between Caracas and La Guaira, 1,100–1,700 m., *Pittier 10390* (W), *10391* (W). Hacienda Taborda, near El Palito, Carabobo, *Pittier 7667* (W). Pico Paloma, *Eggers 13520* (W).—Colombia: Reported by Heimerl from the vicinity of Bogotá, *Karsten.*

Pittier 11950 from the upper Carrasquel Valley probably represents an undescribed species. The single specimen that I have seen is unsatisfactory for purposes of description.

2. CEPHALOTOMANDRA Karst. & Triana

Unarmed trees or shrubs; leaves opposite, petiolate, entire; flowers dioecious, small, yellowish or reddish, tribracteolate, pedicellate, arranged in terminal long-pedunculate many-flowered cymes; staminate perianth urceolate-campanulate, abruptly constricted below the middle, the limb shallowly 5-lobate; stamens numerous, about 25–30, included, the filaments stout, unequal; pistillate perianth with a persistent 5-lobed limb; anthocarp woody, oblong, costate.

One other species of the genus has been described from Panama.

1. **Cephalotomandra fragrans** Karst. & Triana ex Karst. Linnaea 28: 430. 1856. *Pisonia Cephalotomandra* Heimerl, Beitr. Syst. Nyctag. 34. 1897.

A tree 7.5 m. high; leaves slender-petiolate, the blades elliptic-oblong to elliptic, mostly 8–16 cm. long and 4.5–9 cm. wide, acute or obtuse, rounded to acutish at the base, glabrous, subcoriaceous; inflorescences lax, many-flowered, about 10 cm. broad, the slender branches minutely fulvous-puberulent; bractlets lance-subulate, less than 1 mm. long; staminate perianth yellow, 3 mm. long, glabrate or obscurely puberulent; anthocarp about 13 mm. long (even larger according to description), 10–12-costate.

Colombia: Western declivity of the mountains of Bogotá, at 400–1,200 m., *Triana 998* (F; photo. and fragm. of type ex herb. Berol.).

In the original description it is stated that the fruit is as large as an English walnut, but this seems altogether improbable, in consideration of the size of the single dried one that I have seen.

3. TORRUBIA Vell.

Unarmed shrubs or trees, glabrous or pubescent; leaves chiefly opposite and petiolate, entire, membranaceous to coriaceous; flowers small, dioecious, reddish, greenish, or yellowish, exinvolucrate, 2–3-bracteolate, sessile or pedicellate, arranged in lateral or terminal, pedunculate cymes; staminate perianth obconic-campanulate, the limb 5-dentate; stamens 6–10, exserted, the filaments unequal; pistillate perianth tubular; anthocarp drupaceous, red to black, oblong, the exocarp fleshy and juicy.

By most botanists the plants comprising this genus have been referred to *Pisonia*, but there are excellent and basically important characters that distinguish the two groups, consequently it is illogical and unreasonable to combine them under *Pisonia*. Although some

of the species are not well marked, they are much more clearly differentiated than in the genus *Neea*. Only one species of *Torrubia* is known from Peru.

Inflorescences globose and very dense, headlike. Leaves small, rounded to subacute at the apex.....1. *T. ferruginea.*

Inflorescences open, sometimes small but distinctly branched.

Leaves densely or sparsely pubescent beneath over the whole surface when young, in age sometimes glabrate except along the costa.

Leaves rounded or very obtuse at the apex....2. *T. floribunda.*

Leaves chiefly acute or acuminate.

Branchlets and lower surface of the leaves with a fine close ferruginous tomentum; leaves often glabrate beneath in age.

Inflorescences small and few-flowered, dense; leaves chiefly acute to attenuate at the base.....11. *T. salicifolia.*

Inflorescences larger, many-flowered and open; leaves mostly obtuse at the base.....3. *T. Rusbyana.*

Branchlets pilose with spreading hairs.

Leaves chiefly obovate, broadest above the middle. 4. *T. suspensa.*

Leaves oblong to elliptic, broadest at or below the middle.

Leaves densely soft-pilose beneath.....5. *T. pubescens.*

Leaves glabrate in age except beneath along the costa. 6. *T. boliviana.*

Leaves glabrous beneath or nearly so, even when young.

Leaf blades small, 3 cm. long or less, rounded or very obtuse at the apex.....7. *T. microphylla.*

Leaf blades much larger, mostly acute or acuminate.

Leaves bright green when dried; perianth glabrous or nearly so. 8. *T. pacurero.*

Leaves fuscous when dried; perianth often puberulent or tomentulose.

Staminate perianth 5–5.5 mm. long, densely rufous-tomentulose; leaves large, mostly 5.5 cm. wide or more. 9. *T. uberrima.*

Staminate perianth 3.5–4 mm. long; leaves usually narrower.

Veins of the leaves numerous and close together, conspicuous, ascending at a very acute angle; leaves normally broadest above the middle..10. *T. fragrans.*

Veins few, distant, divergent at a comparatively broad angle; leaves mostly broadest at or near the middle. Inflorescence densely rufous-tomentulose, small and few-flowered.....11. *T. salicifolia.*

Inflorescence glabrate or with sparse short hairs. 12. *T. Olfersiana.*

1. **Torrubia ferruginea** (Klotzsch) Standl. Contr. U. S. Nat. Herb. 18: 100. 1916. *Pisonia ferruginea* Klotzsch ex Choisy in DC. Prodr. 13²: 445. 1849. *T. cephalantha* Standl. ex Pittier, Pl. Usual. Venez. 177. 1926.

A deciduous shrub or tree 3–10 m. high, the young branchlets densely rufous-tomentulose; leaves thick-membranaceous or subcoriaceous, small, opposite or verticillate, unequal, fuscous when dried, the petioles short, rufous-tomentulose; leaf blades oblong-elliptic to rounded, mostly 2–5.5 cm. long, rounded to acutish at the apex, acute to rounded at the base, when young densely rufous-hirtulous beneath but in age usually glabrate; flowers in very dense, spherical heads about 1.5 cm. in diameter, densely ferruginous-tomentose, sessile; staminate perianth yellow, 3.5 mm. long; anthocarp oblong, 7 mm. long, sparsely tomentulose or nearly glabrous.

Venezuela: Without locality, *Karsten 148* (F; photo. and fragm. ex herb. Berol.; presumably the type collection, which was reported as from Colombia, probably in error). Colonia Tovar, *Fendler 1314* (F). Between Caracas and La Guaira, *Rose 21829* (W). Zigzag, November 2, 1916, *Rose* (W). El Valle, *Eggers 13162* (W). Barquisimeto, Lara, "not common," *Saer 5* (W). Bare hills north of Barquisimeto, *Saer 168* (W). Above Las Ruinas, near Caracas, on grassy slopes, 1,000 m., *Pittier 9462* (W). Bosque de Catuche, above Caracas, 1,200–1,800 m., *Pittier 6192* (F, W). Lower Catuche wood above Caracas, 1,000–1,200 m., *Pittier 7136* (W). Guaremales, Carabobo, 10–100 m., *Pittier 8837* (W); in forest, *Pittier 8857* (W). Hacienda Panarigua, Valley of Puerto La Cruz, on road to Cagüita, dry wooded hills, *Pittier 9210* (W).

Vernacular name, "cazabito." Regarding the name, Pittier (loc. cit.) makes the following statement: Various trees and shrubs of the family Nyctaginaceae, such as *Torrubia Olfersiana* and *Neea anisophylla*, are given this name, which refers to the characteristic structure of the wood, reminding one at a distance of dry yuca roots or cassava bread. This wood, which is light in weight, porous, and useless, is composed of numerous vascular bundles, derived from the cambium, which are collected about the original bundles and become atrophied and dried, leaving in their place numerous pores. Among the fibers thus formed there are seen many canals and cells that contain crystals of sodium oxalate.

2. **Torrubia floribunda** (Hook. f.), comb. nov. *Pisonia floribunda* Hook. f. Trans. Linn. Soc. 20: 193. 1847.

A tree with rough bark and broadly spreading crown, the branchlets pale, the young ones densely fulvous-puberulent; leaves short-petiolate, thick-membranaceous, mostly clustered on short lateral spurs, the blades oval to elliptic or rounded, about 3 cm. long, rounded or obtuse at the apex, acutish at the base, hirtulous or puberulent on both surfaces, more densely so beneath; staminate inflorescences small and rather dense, many-flowered, short-pedunculate, densely puberulent; perianth broadly obconic, 3 mm. long, sparsely pale-puberulent; young anthocarp ellipsoid-oblong, densely pale-tomentose, costate, 5 mm. long.

Ecuador (Galápagos Islands): Type from James Island, *Darwin*. Duncan Island, at 335 m., *Stewart 1462* (W). James Bay, James Island, 135–500 m., *Stewart 1464* (W). Reported also from Abingdon, Albemarle, Charles, and Indefatigable Islands.

The tree is said to be common on many of the islands, often forming dense forest or thickets. Sometimes it grows as a low shrub.

3. **Torrubia Rusbyana** (Heimerl), sp. nov. *Pisonia Rusbyana* Heimerl in herb.—Frutex vel arbor, ramulis crassiusculis subteretibus griseis vel ochraceis, novellis dense minute ferrugineo-puberulis, internodiis brevibus vel elongatis; folia petiolata crasse membranacea in sicco fuscescentia opposita vel ternata, petiolo gracili 3–40 mm. longo puberulo vel hirtulo; lamina lanceolato-oblonga, elliptico-oblonga vel elliptica, 6–14 cm. longa, 2–6.5 cm. lata, sensim vel abrupte acuta vel acuminata, acumine acuto vel obtuso, basi obtusa vel acutiuscula et saepe obliqua, juvenilis utrinque minute rufo-totentulosa, adulta glabrata vel subtus sparse hirtula, supra ad costam prominulam sparse hirtula, opaca, venis obscuris, subtus concolor, costa gracili elevata, nervis lateralibus utroque latere c. 9 gracilibus prominulis angulo latiusculo adscendentibus irregularibus remote a margine obscure conjunctis, nervulis obsoletis; inflorescentia mascula terminalis 1–5.5 cm. longe pedunculata multiflora sublaxe ramosa 3.5–6 cm. lata erecta, ramulis dense ferrugineo-puberulis, floribus sessilibus vel brevissime pedicellatis, bracteolis vix 0.5 mm. longis ovato-lanceolatis; perianthium obconicum 3.5–4 mm. longum basi acutum sparse minute puberulum vel fere glabrum; stamina c. 8 perianthio duplo longiora; anthocarpium ellipsoideo-oblongum 7 mm. longum ferrugineo-tomentellum apicem versus paullo angustatum.—Venezuela: Lower Orinoco, in 1896, *H. H. Rusby and Roy W. Squires 422* (Herb. Field Mus. No. 161,043, type; duplicate in U. S. Nat. Herb.). Hacienda Puerto La Cruz, Coastal Range, in 1918, *Pittier 8091* (W).

The fruiting specimen collected by Pittier has longer petioles than the type and a more closely appressed pubescence, but it appears to represent the same species as the material from the Orinoco.

4. **Torrubia suspensa** (Heimerl) Standl. Contr. U. S. Nat. Herb. 18: 101. 1916. *Pisonia suspensa* Heimerl, Med. Rijks Herb. 19: 34. 1913.

A tree with broadly drooping branches, the branchlets densely rufous-pubescent; petioles 4–8 mm. long; leaf blades broadly elliptic to obovate-elliptic, 3.5–8.5 cm. long, 2–3 cm. wide, acutish at the base, short-acuminate, papyraceous, brownish when dried, sparsely hirtous above, densely subhirsute beneath, the lateral nerves 6–9 pairs; pistillate inflorescence borne on a peduncle 3–5 cm. long, up to 4.5 cm. wide, lax, many-flowered, umbellately branched at the base, the flowers subsessile or shortly pedicellate; perianth 3–3.5 mm. long, more or less hirtous.

Bolivia: In forest between Guaridi and Río Grande, 600 m., December, 1910, *Herzog 1285* (F, photo. of type ex herb. Berol.).

5. **Torrubia pubescens** (HBK.), comb. nov. *Pisonia pubescens* HBK. Nov. Gen. & Sp. 2: 218. 1818.

A shrub or tree, sometimes 5.5 m. high, the young branchlets densely tomentose or short-villous; leaves opposite or quaternate, often very unequal, membranaceous, fuscous when dried, the petioles seldom more than 5 mm. long; leaf blades oblong to elliptic, mostly 5–9 cm. long and 2–4.5 cm. wide, acute or short-acuminate, at the base acute or obtuse and more or less oblique, copiously pilose with weak fulvous hairs on both surfaces, more densely so beneath, somewhat paler beneath; inflorescences chiefly in the forks of the branches, erect, slender-pedunculate, few-flowered and rather lax, the flowers pedicellate; staminate perianth yellowish, obconic, acute at the base, 4 mm. long, sparsely and minutely puberulent or glabrate; stamens 8; pistillate inflorescence and fruit unknown.

Venezuela: Type from banks of the Río Apures, *Humboldt & Bonpland.* Without data, *Humboldt* (F; photo. of specimen in herb. Willd. ex herb. Berol.; perhaps the type). In hedges, Llanos de La Rubiera, Guárico, *Pittier 12333* (F, B, W). Culebra Lagoon near San Carlos, Cojedes, in savanna bushes, *Pittier 11704* (W).

Heimerl has indicated *Pittier 12333* in the Berlin herbarium as a new species, but this collection agrees perfectly with the original description of *Pisonia pubescens,* and I see no reason for distinguishing it. Pittier describes *No. 11704* as a vine with green flowers. Probably there is some mistake in ascribing a scandent habit to the plant, or else it merely has long branches that are more or less supported on other shrubs.

6. **Torrubia boliviana** (Britton) Standl. Contr. U. S. Nat. Herb. 18: 100. 1916. *Pisonia boliviana* Britton ex Rusby, Bull. Torrey Club 27: 125. 1900.

Young branchlets pilose with short, spreading, fulvous or ochraceous hairs; petioles slender, 1.5 cm. long or less, pilose like the branch-

lets; leaf blades membranaceous, fuscous when dried, elliptic to elliptic-oblong or ovate-elliptic, broadest at or near the middle, 10–18 cm. long, 4–8 cm. wide, acute or abruptly acute at the apex, with very obtuse tip, obtuse to acute at the base, oblique, and often abruptly contracted and short-decurrent, glabrous above or nearly so, beneath sparsely pilose over the whole surface with long spreading hairs, densely pilose along the costa, in age glabrate except along the costa; staminate inflorescences terminal and axillary, small and few-flowered, short-pedunculate, only 1–2 cm. long, the branches sparsely villosulous, the flowers sessile or nearly so; perianth obconic, 3.5 mm. long, glabrous or nearly so; stamens 10; pistillate inflorescence and fruit unknown.

Bolivia: Junction of the rivers Beni and Madre de Dios, *Rusby 2502* (F, W; type collection).

Rusby 2501, mentioned in the original description, is a species of *Neea*.

7. **Torrubia microphylla** (Heimerl) Standl. Contr. U. S. Nat. Herb. 18: 100. 1916. *Pisonia microphylla* Heimerl in Urban, Symb. Antill. 7: 215. 1912.

A shrub or small tree, the young branchlets ferruginous-puberulent; leaves very small, fuscous when dried, subcoriaceous, opposite, the petioles 1.5–2.5 mm. long; leaf blades varying from oblong or oblanceolate-oblong to oval or suborbicular, 2.8 cm. long and 2 cm. wide or smaller, rounded at the apex, rounded to attenuate at the base, at first ferruginous-puberulent beneath along the costa but in age glabrous; staminate inflorescences terminal, short-pedunculate, laxly few-flowered, 3 cm. wide or less, sparsely appressed-hirtulous, the flowers sessile or nearly so; perianth 4–4.5 mm. long, sparsely and minutely puberulent or almost glabrous; stamens 7–8.

Venezuela: El Valle, Margarita Island, *Miller & Johnston 231* (F, type collection, also photo. of type ex herb. Berol.; W). Around El Palito, near Puerto Cabello, in the cactus formation, at sea level, *Pittier 6421* (F, photo. ex herb. Berol.; W).

Pittier 6421 has leaves slightly broader than those of the type, and it has been determined by Heimerl as a new form of *Pisonia microphylla*, but it scarcely merits the distinction of a name.

8. **Torrubia pacurero** (HBK.) Standl. Contr. U. S. Nat. Herb. 18: 101. 1916. *Pisonia pacurero* HBK. Nov. Gen. & Sp. 2: 218. 1818.

A shrub or small tree, sometimes 7 m. high, the branchlets glabrous or only obscurely puberulent; leaves opposite or ternate, membranaceous, bright green or yellowish green when dried, on slender and often elongate petioles; leaf blades chiefly elliptic-oblong to elliptic or ovate-elliptic, sometimes oblong-lanceolate, broadest at or below the middle, 5.5–16 cm. long, 2–6.5 cm. wide, acute to long-acuminate, at the base acute or obtuse, often oblique, some-

times abruptly decurrent, glabrous; staminate inflorescences terminal, on slender, short or elongate peduncles, many-flowered, dense or open, the branches glabrous or nearly so; perianth green, whitish, or reddish, obconic, 4 mm. long, glabrous; stamens 8; pistillate perianth tubular, 2 mm. long; anthocarp narrowly oblong, 1 cm. long, conspicuously costate, glabrous.

Trinidad: Island of Patos, a small tree with brittle wood, *Broadway 2714* (F).—Venezuela: Cumaná, *Humboldt* (F; photo. of type ex herb. Berol.; type locality given in the original description as "locis umbrosis siccis Novae Andalusiae"). Aricana, on hills, *Broadway 345* (W); near the shore, *Broadway 609* (W); seashore, *Broadway 807* (W). Cristóbal Colón, *Broadway 691* (W); on hills, *Broadway 198* (W); near the sea, *Broadway 232* (W). Hacienda Taborda, near El Palito, Carabobo, *Pittier 7667* (F), *7677* (F, W; these two numbers are mixed with material of *Neea anisophylla*). Hacienda Puerto La Cruz, Coastal Range, Distrito Federal, *Pittier 8093* (W). Río Turbio, near Barquisimeto, Lara, *Saer 237* (W). Río Chico, Miranda, *Jahn 1275* (W). Around El Palito, near Puerto Cabello, Carabobo, in the cactus formation, at sea level, *Pittier 6422* (F, W); on hills, *Pittier 9074* (W). Puerto Cabello, common, *Curran & Haman 1180* (F, W); *Curran & Haman 1169* (W), *1147* (W). Without locality, *Curran & Haman 1221* (W). Between Adecora and Pueblo Nuevo, Paraguana, *Curran & Haman 563* (W). Isla de San Carlos, *Curran & Haman 784* (W). Santa Lucía, *Curran & Haman 1097* (F, W).—Colombia: "Colombia," *Karsten 18* (F; fragm. ex herb. Berol.). Region of Santa Marta, near sea level, *H. H. Smith 2741* (F, W), *2096* (F, W), *397* (F, W).

This is a well-marked species, easy to recognize because of its thin, bright green leaves, and almost complete lack of pubescence. The name has been applied sometimes to the forms referable to *Torrubia fragrans*, and even to other species not very closely related.

The vernacular names "pacurero," "casabito," and "fruta de culebra" are reported from Venezuela.

9. **Torrubia uberrima,** sp. nov.—Ramuli novelli dense minuteque adpresse ferrugineo-tomentulosi subteretes graciles, internodiis brevibus; folia opposita firme membranacea in sicco fusco-brunnea longiuscule petiolata, petiolo gracili 1.5–3 cm. longo dense ferrugineo-tomentuloso; lamina elliptico-oblonga vel ovato-oblonga, prope vel infra medium latissima, 13–16.5 cm. longa, 5.5–7 cm. lata, acuminata, basi valde obliqua et uno latere abrupte decurrens, glabra vel in statu juvenili ad costam minute ferrugineo-tomentulosa, supra opaca, costa venisque vix prominulis, subtus fere concolor, costa gracili prominente, nervis lateralibus utroque latere c. 9 gracillimis prominulis angulo semirecto adscendentibus remote a margine laxe conjunctis, nervulis obsoletis; inflorescentia mascula terminalis c. 9 cm. longe pedunculata, pedunculo ut ramuli dense ferrugineo-tomentello erecto, panicula laxe multiflora 6–8 cm. longa 10–13 cm.

lata rotundata, ramis basalibus oppositis vel verticillatis patentibus, floribus sessilibus vel vix 1 mm. longe pedicellatis in cymulas densas paucifloras dispositis; perianthium masculum obconicum 5–5.5 mm. longum basi acutum dense ferrugineo-tomentulosum, lobis brevissimis; stamina c. 6 perianthio fere duplo longiora.—Colombia: Region of Santa Marta, near sea level, September, 1898–1901, *Herbert H. Smith 1873* (Herb. Field Mus. No. 138,714, type; duplicate in U. S. Nat. Herb.).

The type collection was distributed as *Pisonia ferruginea* Klotzsch, to which the plant has no close relationship.

Here may belong the following fruiting specimens from Colombia: San Martín de Loba, Dept. Bolívar, *Curran 371* (W), *184* (W). Curran describes the plant as a tree 6.5 m. high, with a trunk 10 cm. in diameter, vernacular name "clavo cuchillo."

10. **Torrubia fragrans** (Dum.-Cours.) Standl. Contr. U. S. Nat. Herb. 18: 100. 1916. *Pisonia fragrans* Dum.-Cours. Bot. Cult. ed. 2. 7: 114. 1814. *P. eucalyptifolia* HBK. Nov. Gen. & Sp. 7: 197. 1825.

A tree 15 m. high or less, the trunk up to 30 cm. in diameter, the branchlets grayish- or rufous-puberulent; leaves opposite, often very irregular and unequal, the petioles 3–10 mm. long; leaf blades rhombic-elliptic to obovate-oblong, obovate, or oblanceolate, 3–9 cm. long, 2.5–5 cm. wide, broadest above the middle, at the apex abruptly acute or acuminate to rounded, at the base acute to attenuate, fuscous when dried, firm-membranaceous, glabrous or practically so, the lateral nerves numerous and conspicuous; inflorescences mostly terminal, pedunculate, commonly small and rather few-flowered, 2–6 cm. broad, the branches puberulent or glabrate, the flowers sessile or on pedicels 1–2 mm. long; staminate perianth puberulent; stamens 6–8; anthocarp ellipsoid-oblong, 7–11 mm. long, glabrous.

Curaçao: Hofje Abau, *Curran & Haman 104* (W). Klein Sint Martha, *Curran & Haman 138* (W).—Tobago: Providence Road, a small tree with greenish flowers, *Broadway 3544* (F). Calderhal, *Broadway 3541* (F).—Venezuela: San Juan Mountain, Margarita Island, 600 m., *Johnston 121* (F, W). Between Morón and El Sanchón, Carabobo, *Pittier 12205* (F, W). Cristóbal Colón, a small tree with green flowers, *Broadway 740* (W).—Colombia: Region of Santa Marta, 75 m., *H. H. Smith 396* (F, W). Widely distributed in the West Indies.

The vernacular name "laabra" is reported from Curaçao.

Pittier 12205 is indicated by Heimerl, in the Berlin herbarium, as a new species, but it does not seem to the writer more than a form of *T. fragrans*, differing chiefly in the shape of the leaves, which are unusually narrow, and rounded or very obtuse at the apex.

The locality of *Pisonia eucalyptifolia* is given merely as "inter tropicos Americae." It is possible that it is not really a synonym of *Torrubia fragrans*, although the description agrees well with the plant described here. It seems probable that the proper name for *T. fragrans* is *Torrubia inermis* (Jacq.) Britton (Bull. Torrey Club 31: 614. 1904. *Pisonia inermis* Jacq. Sel. Stirp. 275. 1763). The type locality of Jacquin's species is the region of Cartagena, Colombia. No specimens of *Torrubia* from that locality have been seen by the writer, but if any of the species here listed occurs about Cartagena, it is almost certain to be *T. fragrans*. Jacquin's description is unsatisfactory and incomplete but, so far as it goes, it applies satisfactorily to *T. fragrans*.

11. **Torrubia salicifolia** (Heimerl) Standl. Contr. U. S. Nat. Herb. 18: 101. 1916. *Pisonia salicifolia* Heimerl in Urban, Symb. Antill. 7: 216. 1912.

A small tree, the young branchlets densely ferruginous-puberulent; leaves opposite, fuscous when dried, the petioles 1–11 mm. long; leaf blades chiefly oblong-lanceolate or narrowly elliptic-oblong, mostly 5–9 cm. long and 1.5–3 cm. wide, subabruptly acuminate or long-acuminate, cuneately acute at the base, hirtulous at first but soon glabrate except sometimes along the costa; staminate inflorescence pedunculate, 3 cm. wide or less, the slender branches spreading; pistillate flowers yellowish; staminate perianth ferruginous-hirtulous; stamens 6–7; anthocarp ellipsoid-oblong, 10–11 mm. long.

Trinidad: Type from Moruga, *Broadway 2421*. Buenos Ayres, Erin, May 9, 1919, *Broadway* (F).—British Guiana: Without locality, *Jenman* (F). Pomeroon District, Moruka River, *De La Cruz 4557* (F).

This is probably no more than a form, and not a clearly defined one, of *T. Olfersiana*.

12. **Torrubia Olfersiana** (Link, Klotzsch & Otto) Standl. Contr. U. S. Nat. Herb. 18: 101. 1916. *Pisonia Olfersiana* Link, Klotzsch & Otto, Icon. Pl. Rar. 36. *pl. 15*. 1841. *P. Cafferiana* Casar. Nov. Stirp. Bras. 68. 1842. *P. guianensis* Klotzsch in Schomb. Fauna & Fl. Brit. Guian. 1131. 1848, nomen nudum. *P. minor* Choisy in DC. Prodr. 13^2: 443. 1849. *P. nitida* Mart. ex Schmidt in Mart. Fl. Bras. 14^2: 356. 1872. *P. acuminata* Mart. ex Schmidt, op. cit. 357. 1872. *P. Eggersiana* Heimerl, Bot. Jahrb. Engl. 21: 627. 1896. *P. Schomburgkiana* Heimerl, Beitr. Syst. Nyctag. 34. 1897, nomen nudum. *P. Olfersiana* var. *nitida* Heimerl, Beitr. Syst. Nyctag. 35. 1897. *Torrubia Cafferiana* Standl. Contr. U. S. Nat. Herb. 18: 100. 1916. *T. Eggersiana* Standl. loc. cit. 1916. *T. nitida* Standl. op. cit. 101. 1916.

A shrub or tree, sometimes as much as 15 m. high, the branchlets glabrous or sometimes villosulous or puberulent; leaves chiefly opposite, fuscous when dried, thick-membranaceous or subcoriaceous, the petioles commonly about 1 cm. long; leaf blades oblong to elliptic, usually 9–16 cm. long and 3–6 cm. wide, abruptly acuminate or acute, rarely obtuse, acute at the base, usually glabrous; inflorescences on long or short peduncles, lax and many-flowered, sparsely puberulent or hirtous or almost glabrous; flowers greenish, the perianth sparsely and minutely puberulent; stamens 5–7; anthocarp dark purple, ellipsoid-oblong, 8–12 mm. long.

Tobago: The Widow, *Broadway 4155* (F). Roseborough Estate, *Broadway 4532* (F).—Trinidad: Mora Forest via Sangre Grande, *Broadway 5696* (F). St. Anns, in light forest, June 11, 1922, *Broadway* (F).—French Guiana: "Cayenne," *Jelski* (F; photo. and fragm. ex herb. Berol.).—Surinam: *Kegel 653* and *Wullschlaegel 1005* (reported by Heimerl as *Pisonia Eggersiana*).—British Guiana: Without definite locality, *Schomburgk 1031, 600, 595* (F; photo. and fragms. ex herb. Berol.). Without locality, *Schomburgk 588* (F; photo. and fragm. ex herb. Berol.). Kabakaburi, Pomeroon District, *De La Cruz 3315* (F, W), *3317* (F, W). Kamakusa, Upper Mazaruni River, *De La Cruz 4120* (F). Pomeroon River, *De La Cruz 3017* (F). Issorora, Aruka River, in hill forest, *Hitchcock 17550* (W).—Venezuela: Los Teques, Miranda, 1,400–1,500 m., *Pittier 7499* (W). Quebradita de las Ruinas, Federal District, 800–1,000 m., in light forest, *Pittier 9463* (W). Cariaquita, Paria Peninsula, *Bond, Gillin & Brown 246* (W). Mesa de El Sombrero, Guárico, in bushes around savanna, *Pittier 12371* (W). Quebrada de Chacaito, Federal District, 800–1,000 m., near cascade in forest, *Pittier 10323* (W).—Brazil: Without locality, *Sello* (F; photo. and fragm. ex herb. Berol.). Rio de Janeiro, *Sello* (F; fragm. ex herb. Berol.). Without locality, *Regnell III. 1021* (F).—Ecuador: Balao, in forest, *Eggers 14249* (W).—Bolivia: Bosques del Río Surutú, Dept. Santa Cruz, 400 m., *Steinbach 7284* (F; photo. and fragm. ex herb. Berol.).

The vernacular name is reported from Venezuela as "salado." *Steinbach 7284* has been determined by Heimerl as a new species, and it may be distinct from *T. Olfersiana*, but the incomplete material available for examination does not seem to be essentially different.

The material here cited is conspicuously variable in leaf form and in pubescence, but it does not seem practical to separate it into several species. Other related species probably must be reduced to synonymy under *T. Olfersiana*, when more abundant material has accumulated, because the slight differences upon which they have been based probably are not constant.

4. PISONIA L.

Trees or shrubs, erect or more often with long, pendent or clambering branches, often armed with spines; leaves chiefly opposite and

petiolate, entire; flowers dioecious, small, reddish or yellowish green, arranged in sessile or pedunculate cymes, exinvolucrate, 2–3-bracteolate; staminate perianth obconic-campanulate, the limb 5-dentate; stamens 6–8, exserted, unequal; pistillate perianth tubular, the limb 5-dentate; anthocarp coriaceous, clavate to oblong or obovoid, terete and costate or 5-angulate, the angles or costae furnished with one or more rows of viscid stipitate glands.

Anthocarp with glands only along the upper part.....1. *P. zapallo.*

Anthocarp with glands along the whole length of the angles.

Mature fruit 6–10 mm. in diameter, the glands along the angles in two or more rows; spines few or wanting on the flowering branches.....2. *P. macranthocarpa.*

Mature fruit 3–4 mm. in diameter, the glands along the angles in a single row or nearly so; flowering branches usually armed with recurved spines.....3. *P. aculeata.*

1. **Pisonia zapallo** Griseb. Goett. Abh. 24: 39. 1879. *P. aculeata* f. *inermis* Kuntze, Rev. Gen. 3²: 265. 1898.

A small tree, unarmed; leaves slender-petiolate, the blades broadly elliptic to ovate, mostly 5–10 cm. long, acute at the base, acute to subobtuse at the apex, when young tomentose beneath, in age sparsely pilose or glabrate; cymes pedunculate, tomentose, the flowers glomerate; staminate perianth 2 mm. long; anthocarp narrowly clavate, 15–20 mm. long, the glands in 2 or more series along each angle above the middle of the fruit.

Bolivia: Río Achira, 1,000 m., *Steinbach 8223* (F). Sierra de Santa Cruz, 1,600 m., May, 1892, *Kuntze* (F, type collection of *P. aculeata* f. *inermis*).—Also in Argentina.

From Argentina there are reported for this species the vernacular names "palo de zapallo," "zapallo caspi," and "ombú-rá."

2. **Pisonia macranthocarpa** Donn. Smith, Bot. Gaz. 20: 293. 1895. *P. aculeata* var. *macranthocarpa* Donn. Smith, Bot. Gaz. 16: 198. 1891. *P. aculeata* var. *pedicellaris* Griseb. ex Heimerl, Bot. Jahrb. Engl. 21: 633. 1896.

A shrub or small tree, 3–4 m. high or sometimes larger, the branchlets puberulent when young but soon glabrate; spines few and often or usually wanting on herbarium specimens, mostly straight; leaf blades elliptic to oval or obovate, acute at the base, acute to acuminate at the apex, puberulent or short-villous beneath along the costa or often glabrate in age; inflorescence pedunculate, the staminate cymes dense, many-flowered, 2–3.5 cm. broad, the flowers short-pedicellate; staminate perianth yellowish green, 3–4 mm. broad, puberulent; stamens usually 8, twice as long as the perianth; anthocarp woody, 1–2 cm. long, densely tomentulose.

Venezuela: La Trinidad de Maracay, Aragua, 440 m., *Pittier 5851* (W). Valencia, *Rose 21837* (W). Lara, *Saer 156* (W).—Colombia: Region of Santa Marta, *H. H. Smith 395* (F, W).—Ecuador: Guayaquil, *Stevens 39* (W). Durán, *Rose & Rose 23611* (W). Near Guayaquil, in woods, *Mille 206* (W). Daule, *André K829* (F). El Recreo, *Eggers 15332* (F). Also in Cuba, Central America, and southern Mexico.

Known in Salvador by the names "espuela del diablo" and "guaco."

3. **Pisonia aculeata** L. Sp. Pl. 1026. 1753.

A shrub or a small tree, densely branched, sometimes with a thick trunk, the branches often very long and scandent, or more frequently pendent, armed with numerous stout recurved spines; leaves petiolate, the blades elliptic to ovate or even rounded, mostly 4–8 cm. long, acute to rounded at the base, acute or acuminate at the apex, glabrate beneath or frequently puberulent or short-villous; staminate cymes pedunculate, loosely or densely cymose, 2–6 cm. broad, many-flowered; staminate perianth 2–4 mm. long, yellowish green, densely puberulent or tomentulose; stamens usually 6, twice as long as the perianth; anthocarp 9–12 mm. long, puberulent or glabrate.

Colombia: Region of Santa Marta, 45 m., *H. H. Smith 1861* (F, W). Ranging through the West Indies to Florida, and in Central America and Mexico; occurring also in the Old World tropics.

The species has been reported from Venezuela, but the reports probably relate to *P. macranthocarpa*, which is closely related but quite distinct. It is common in Central America at low elevations, often growing in thickets near the seashore. In Central America it is known by the names "espino negro" and "cagalero," and in Mexico and Cuba as "uña de gato."

5. PISONIELLA (Heimerl) Standl.

Erect shrubs, dichotomously much branched; leaves opposite, petiolate, entire; flowers perfect, in headlike, pedunculate, axillary and terminal, many-flowered umbels, pedicellate, each pedicel subtended by a minute bract; perianth tubular-campanulate, slightly constricted at the middle, the limb shallowly 5-lobate, the lobes rounded or subtruncate; stamens 6–11, the filaments exserted; anthocarp oblong-clavate, slightly curved, coriaceous, obtuse at the apex, attenuate below, 5-costate, the angles bearing numerous verruciform glands.

The genus consists of a single species.

1. **Pisoniella arborescens** (Lag. & Rodr.) Standl. Contr. U. S. Nat. Herb. 13: 385. 1911. *Boerhaavia arborescens* Lag. & Rodr. Anal. Cienc. Nat. 4: 257. 1801. *Pisonia hirtella* HBK. Nov. Gen.

& Sp. 2: 217. 1818. *Pisonia arborescens* Kuntze, Rev. Gen. 3²: 265. 1898.

The species grows in central and southern Mexico. In South America it is represented by the following variety:

1a. **Pisoniella arborescens** (Lag. & Rodr.) Standl., var. **glabrata** Heimerl, Ann. Cons. Jard. Bot. Genève 14: 231. 1914. *Pisonia hirtella* f. *glabrata* Heimerl, op. cit. 5: 196. 1901. *Pisoniella glabrata* Standl. Contr. U. S. Nat. Herb. 13: 386. 1911.

A slender shrub, densely branched, the young branchlets ferruginous-tomentulose, soon glabrate; leaves on short slender petioles, the blades thin, ovate to oblong-elliptic, mostly 3.5–8 cm. long, acute to attenuate at the base, abruptly acute to very long-attenuate at the apex, glabrous or nearly so; peduncles 2–10 cm. long, the umbels dense, many-flowered, 12–15 mm. in diameter, the flowers short-pedicellate; perianth greenish white, 5–7 mm. long, sparsely and minutely viscid-puberulent; anthocarp 1 cm. long and 1.5–2 mm. thick, dark brown, glabrous.

Bolivia: Valle de Cochabamba, 2,600 m., *Steinbach 8728* (F). Sorata, 2,400 m., *Rusby 2500* (F, W, type collection; cited erroneously as "2510" in the original publication). Cochabamba, *Bang 1063* (F, W). Without locality, *Bang 1809* (F, W). Cochabamba, 3,000 m., March, 1892, *Kuntze* (F).—Argentina: El Rastrojo, Prov. Catamarca, 1,600 m., *Jörgensen 1240* (W). Siambón, Sierra de Tucumán, *Lorentz & Hieronymus 776* (F).

The variety is isolated by a great distance from the area occupied by the typical form of the species, in Mexico, but the differences between the type and the variety are so slight that they would scarcely deserve attention if both forms occupied the same area.

6. SALPIANTHUS Humb. & Bonpl.

Large herbs or small shrubs, pubescent and usually viscid; leaves alternate, petiolate, the blades broad, entire; flowers perfect, not involucrate, ebracteate, very small, glomerate or racemose, forming terminal and axillary, panicled cymes; perianth campanulate, urceolate, tubular, or pyriform, green or reddish, persistent, scarcely accrescent, the limb with 4–5 teeth or lobes; stamens 3–5; fruit subglobose, sometimes somewhat compressed, coriaceous, minute.

About three additional species of the genus are known from Mexico.

Leaves bright green, acute or acuminate, large; flowers in panicled cymes; perianth campanulate, with very short teeth, bearing numerous uncinate hairs.....1. *S. purpurascens.*

Leaves grayish, usually rounded at the apex, small; flowers in racemosely arranged cymes; perianth pyriform, at least in age,

with conspicuous, more or less spreading lobes, without uncinate hairs. . . . . .2. *S. pyriformis.*

1. **Salpianthus purpurascens** (Cav.) H. & A. Bot. Beechey Voy. 308. 1837. *Boldoa purpurascens* Cav. ex Lag. Gen. & Sp. Nov. 10. 1816. *B. ovatifolia* Lag. loc. cit. 1816. *Cryptocarpus globosus* HBK. Nov. Gen. & Sp. 2: 187. *pl. 123.* 1818. *C. paniculatus* HBK. ex Schlecht. Linnaea 26: 643. 1853.

Plants herbaceous or suffrutescent, 2 m. high or less, much branched, the branches slender, sparsely puberulent or glabrate, those of the inflorescence viscid and bearing numerous short uncinate hairs; leaves long-petiolate, the blades broadly rhombic-ovate to ovate-deltoid, 5–22 cm. long, acute or acuminate, at the base abruptly contracted and long-decurrent, finely scaberulous when young but soon glabrate; flowers sessile or subsessile; perianth 2.5–3 mm. long, green, 4-dentate; stamens 4, exserted; fruit subglobose, 1.5 mm. in diameter.

Venezuela: Near Caracas, 900–1,150 m., *L. H. & E. Z. Bailey 675* (W). Maracay, Aragua, *Cornelio 87* (W). Type of *C. paniculatus* apparently *Wagener 289* from Maiquetía. Also in Mexico and Central America.

Heimerl reports the species from Colombia, but without citation of material to support its occurrence there.

2. **Salpianthus pyriformis** (HBK.), comb. nov. *Cryptocarpus pyriformis* HBK. Nov. Gen. & Sp. 2: 188. *pl. 124.* 1818. *C. cordifolius* Moric. Pl. Amér. 75. *pl. 50.* 1830. *C. pyriformis* var. *cordifolius* Moq. in DC. Prodr. 13^2: 88. 1849.

Plants herbaceous or suffrutescent, usually more or less scandent, and 2 m. long, sometimes scandent to a height of 10 m., the branches densely viscid-puberulent; leaves on stout petioles, the blades rhombic-ovate to broadly ovate-deltoid or rounded-ovate, mostly 2.5–5 cm. long, usually cordate or deeply cordate at the base but varying to rounded, rounded or very obtuse at the apex, densely viscid-puberulent or tomentulose on both surfaces; inflorescence very leafy or naked, densely viscid-puberulent, the flowers subsessile; perianth less than 2 mm. long; stamens 4; anthocarp globose, blackish, 1 mm. in diameter.

Ecuador: Reported from Guayaquil, and also from Abingdon, Albemarle, Barrington, Bindloe, Charles, Chatham, Indefatigable, James, Jervis, Narborough, and Seymour Islands of the Galápagos Islands. Occurring also in Peru.

Called "nacupillo" in Peru.

By Heimerl and others this plant has been treated as the type of a distinct genus, *Cryptocarpus.* It does not seem to possess any important characters that distinguish it from *Salpianthus*, and it

is therefore preferable to treat it as a member of that genus. By Moquin this plant, as well as *S. purpurascens*, was referred to the family Chenopodiaceae. In volume 13, part 2, of De Candolle's *Prodromus*, *S. purpurascens* appears twice under different names, on page 88 in the genus *Cryptocarpus* among the Chenopodiaceae, and on pages 438 and 439 under *Boldoa*, among the Nyctaginaceae. *Cryptocarpus cordifolius* was described from Guayaquil.

7. BOUGAINVILLEA Commers.

Shrubs or small trees, often scandent, usually armed with simple or branched spines; leaves alternate, petiolate, entire; flowers perfect, either solitary and subtended by 3 bracts, or usually in a 3-flowered axillary inflorescence consisting of 3 large, persistent, often brightly colored bracts, a flower borne on the inner surface of each bract, its pedicel confluent with the costa of the bract; perianth tubular, the limb usually shallowly 5-lobed, the tube subterete or 5-angled; stamens 5–10, somewhat unequal, connate at the base into a short cup; anthocarp fusiform, coriaceous, 5-costate.

Bracts brightly colored, purplish red or bright red, retaining the color when dried, mostly 2.5–4 cm. long.

Perianth tube glabrous.....1. *B. peruviana.*

Perianth tube variously pubescent.

Perianth tube hirsute or villous; leaves usually copiously villous.
2. *B. spectabilis.*

Perianth tube puberulent or glabrate; leaves glabrate.
3. *B. glabra.*

Bracts green, or sometimes brightly colored when fresh but losing their color when dried, usually smaller, and only 1–2.5 cm. long.

Perianth only 6.5–7 mm. long, gradually dilated from base to apex, glabrate, or hirtous above; bracts 7–12 mm. long.
4. *B. campanulata.*

Perianth 9–20 mm. long, constricted above; bracts 13–27 mm. long.

Perianth glabrous, 11–14 mm. long; bracts 25–27 mm. long, 13–15 mm. wide, glabrous except on the costa.
5. *B. berberidifolia.*

Perianth variously pubescent; bracts 13–22 mm. long.

Perianth 9–11 mm. long, densely tomentulose..6. *B. praecox.*

Perianth 12–20 mm. long.

Perianth puberulent.....7. *B. stipitata.*

Perianth pubescent or hirsute.....8. *B. infesta.*

1. **Bougainvillea peruviana** H. & B. Pl. Aequin. 1: 174. *pl. 49.* 1808. *Tricycla peruviana* Poir. Encycl. Suppl. 5: 359. 1817.

A shrub 3–7 m. high, erect or scandent, armed with numerous slender spines 1–2.5 cm. long, the branches sparsely puberulent or glabrate; leaves thin, slender-petiolate, the blades broadly ovate to suborbicular, 5–7 cm. long, subtruncate at the base, subobtuse or abruptly acute at the apex, except when very young glabrous or nearly so; bracts bright rose, 1.5–3.5 cm. long, obtuse or rounded at the apex, glabrous except along the puberulent costa; perianth 16–20 mm. long, white or whitish, the limb 5–6 mm. broad; stamens usually 6; anthocarp about 10 mm. long and 2.5 mm. thick, glabrous.

Colombia: Gigante, Dept. Huila, in 1920, *Bro. Ariste-Joseph* (W). —Ecuador: Without locality, *Townsend 837* (W). Without locality (perhaps from Colombia), *Lehmann B. T. 446* (F). Naranjo, *André K.708* (F). Also in Peru.

Townsend reports the vernacular name as "papelillo." This species is closely related to *B. glabra*, but the dried specimens, when compared with others of that species, have a plainly different aspect.

2. **Bougainvillea spectabilis** Willd. Sp. Pl. 2: 348. 1789.

A large woody vine, armed with numerous stout spines 4 cm. long or shorter, the branches copiously fulvous-villous, rarely glabrate; leaf blades broadly ovate to suborbicular or rounded-oval, 5–10 cm. long, rounded to acutish at the base and often short-decurrent, abruptly acute or acuminate at the apex, usually densely villous beneath; bracts purplish red, ovate-oval or broadly ovate, 2–4.5 cm. long, subcordate at the base, abruptly acute or acuminate or sometimes obtuse at the apex, sparsely puberulent or short-villous; perianth 15–30 mm. long, the tube green, the limb 6–7 mm. wide, yellowish; anthocarp 11–14 mm. long, densely short-villous.

Bolivia: Unduavi (doubtless cultivated), *Bro. Julio 358* (W). Native of Brazil.

This Brazilian plant is cultivated for ornament in many parts of the tropics, but in most regions it is far less common than *B. glabra*. From Argentina there are reported the vernacular names "Santa Rita" and "Tres Marías."

3. **Bougainvillea glabra** Choisy in DC. Prodr. 13^2: 437. 1849. *B. spectabilis* var. *glabra* Hook. in Curtis's Bot. Mag. *pl. 4810.* 1854.

A large woody vine, armed with numerous stout spines, the branchlets puberulent when young but soon glabrate; leaf blades broadly ovate to ovate-lanceolate, 4–10 cm. long, rounded to acute at the base, abruptly or gradually acute to acuminate at the apex, puberulent when young but quickly glabrate; bracts commonly purplish red, broadly ovate to oval, subcordate at the base, commonly abruptly acute or acuminate at the apex, sparsely puberulent or

glabrous; perianth 15–25 mm. long; stamens 8; anthocarp turbinate, 7–13 mm. long, with 5 acute angles.

Venezuela: El Valle, Margarita Island, *Miller & Johnston 99* (F, W).—Colombia: Medellín, Dept. Antioquía, *Archer 763* (F). Barranquilla, *Bro. Paul 34* (W). Cartagena, *Bro. Heriberto 153* (W). La Esperanza, Dept. Cundinamarca, *Bro. Ariste-Joseph* (W). Between El Colegio and Tequendama, Cundinamarca, *Bro. Ariste-Joseph 1069* (W).—Ecuador: Guayaquil, *Mille 16* (W). Native of Brazil.

This is the common Bougainvillea of cultivation, that is grown for ornament in most tropical regions, often in such abundance that one becomes excessively bored with its continued display. In Ecuador and Colombia the vine is called "flor de verano"—summer flower—because it blooms during the dry months, the "summer" of tropical America, although the winter months of the north. The name "trinitaria" also is used for the plant in Colombia, and from Argentina there are reported the names "Santa Rita" and "Tres Marías."

The species is not too distinct from *B. spectabilis*, although probably it has as good characters as most other members of the genus. It might be preferable to treat it as a variety of that species, as was done by Hooker.

4. **Bougainvillea campanulata** Heimerl, Med. Rijks Herb. 19: 33. 1913.

A shrub or small tree, unarmed, the branchlets glabrous or when young minutely tomentulose; leaves short-petiolate, elliptic-lanceolate or narrowly oblong-elliptic, 2 cm. long and 12 mm. wide or smaller, broadest at the middle, obtuse at the apex, acute at the base, minutely hirtellous beneath along the costa, otherwise glabrous; bracts elliptic to obovate-elliptic, 7–12 mm. long, 4–6.5 mm. wide, subobtuse to rounded at the apex, yellowish green, sparsely puberulent or villosulous; perianth 6.5–7 mm. long, yellow, hirtous above, the limb 9–10 mm. broad; stamens 7–8.

Bolivia: Yuquirenda, left bank of the Río Pilcomayo, 400 m., *Herzog 1124*, type. Comarapa, Dept. Santa Cruz, 2,000 m., *Steinbach 8579* (F). Without locality, *Herzog 1137* (photo. ex herb. Berol.). Villamontes, *Pflanz 696* (fragm. ex herb. Berol.).—Argentina: Balcoyna, Dept. del Alto, 1,250 m., *Venturi 7240* (F). Reported from the departments of Formosa, Tucumán, and Jujuy.

The vernacular name is reported from Argentina as "coronillo."

5. **Bougainvillea berberidifolia** Heimerl, Denkschr. Akad. Wiss. Wien 70: 121. *pl. 1, f. 2–3*. 1900.

A spiny shrub, the spines mostly 1–2 cm. long, the branchlets sparsely tomentulose when young, soon glabrate; leaf blades elliptic to obovate-elliptic, broadest at or above the middle, 1.5–2.5 cm.

long, rounded or obtuse at the apex, attenuate to the base, glabrate; bracts bright rose, but turning greenish when dried, ovate-oblong, 25–27 mm. long, 13–15 mm. wide, subobtuse, sometimes suborbicular and broadly rounded at the apex, glabrous except along the costa; perianth 11–14 mm. long, yellowish or red, glabrous, the limb 4–5 mm. broad; stamens usually 5.

Bolivia: Type collected by Cuming, without locality; Heimerl reports also a specimen collected by Bridges, without number, and *Orbigny 517*, from Valle Grande. In spiny thickets of Pulquina and Comarapa, 1,900 m., *Herzog 1799* (photo. ex herb. Berol.).

6. **Bougainvillea praecox** Griseb. Symb. Fl. Argent. 40. 1879. *B. praecox* var. *spinosa* Chod. & Hassl. Bull. Herb. Boiss. II. 3: 415. 1903. *B. praecox* var. *rhombifolia* Heimerl, Verh. Zool. Bot. Ges. Wien 62: 4. 1912. *B. modesta* Heimerl, Denkschr. Akad. Wiss. Wien 70: 118. *pl. 1, f. 4.* 1900.

A shrub or tree, sparsely spiny or unarmed, the spines mostly 5 mm. long or less, the branchlets tomentulose or soon glabrate; leaf blades ovate to elliptic or ovate-elliptic, 8 cm. long and 4 cm. wide or smaller, narrowed to an obtuse apex, acute or attenuate at the base, appressed-tomentose beneath at first but later glabrate; bracts white or reddish, becoming greenish when dried, broadly ovate, about 14 mm. long and 12 mm. wide, rounded or subcordate at the base, rounded or very obtuse at the apex, densely puberulent, especially on the veins; perianth 9–11 mm. long, densely tomentulose, the limb 4 mm. broad; stamens 5–6.

Bolivia: Piragwald, Dept. Santa Cruz, 400 m., *Steinbach 8122* (F). Near Coroico, *Bang 2398* (F, W; type collection of *B. modesta*). Huachi, head of Beni River, 540 m., *White 973* (F, W). Heimerl reports also the following collections: Between Ipawassu and Fortín d'Orbigny, *Herzog 1076, 1073* (var. *rhombifolia*). Left bank of Río Pilcomayo, *Herzog 1106* (var. *spinosa*).

The species occurs also in Argentina and Paraguay. The vernacular name "duraznillo" is reported from Argentina. The two varieties described by Heimerl are minor forms scarcely worthy of nomenclatorial recognition, especially in a group in which the individual variations are so great. Heimerl suggested the possibility of combining *B. praecox* and *B. modesta*, and to the present writer there do not appear to be good grounds for separating them. The same might be said also of most of the other species listed here, for the differences between them certainly are for the most part rather inconsequential ones. *B. modesta* is described as a tree 25 m. high, but the description is probably erroneous in ascribing such a height to the tree.

7. **Bougainvillea stipitata** Griseb. Symb. Argent. 39. 1879. *B. longispinosa* Rusby, Mem. Torrey Club 6: 109. 1896. *B. stipitata* var. *longispinosa* Heimerl, Denkschr. Akad. Wiss. Wien 70: 116.

1900. *B. stipitata* var. *Kuntzeana* Heimerl, op. cit. 117. 1900. *B. stipitata* var. *Fiebrigii* Heimerl, Bot. Jahrb. Engl. 42: 76. 1908.

A shrub or small tree, unarmed or armed with stout or slender spines 2.5 cm. long or less, the young branches puberulent or tomentulose; leaves petiolate, the blades ovate, rhombic, deltoid-ovate, or rarely lanceolate, usually acuminate but sometimes obtuse, at the base rounded to acute, often decurrent, puberulent or glabrous, 3.5–7.5 cm. long; bracts green or tinged with rose, greenish when dried, broadly ovate or ovate-elliptic, 14–20 mm. long, 12–15 mm. wide, subtruncate to shallowly cordate at the base, obtuse or acutish at the apex, sparsely or rather densely puberulent; perianth 13–20 mm. long, greenish, puberulent or rarely glabrous; stamens 7–8; anthocarp fusiform, 12–15 mm. long, minutely puberulent or glabrous.

Bolivia: Region of Cochabamba, *Bang 1123* (F, W, type collection of *B. longispinosa*). Tunari, 1,500 m., April, 1892, *Kuntze* (F, type collection of var. *Kuntzeana*). Bermejo, 1,400 m., *Fiebrig 2352* (F). Chiquiacá, 1,000 m., *Fiebrig 2689* (F). Tatarenda, Gran Chaco, *Fries 1478* (W). Chinchilla apud Paicho a Tarija occidentem versus in declivibus rupestribus, 3,000 m., *Fiebrig 3049* (F, type collection of var. *Fiebrigii*). Reported by Heimerl from the following stations: Villa Montes on the Río Pilcomayo, 460 m., *Herzog 1137*. Between Cumbarute and Itatique, 800 m., *Herzog 1181*. Samaipata, 1,650 m., *Herzog 1724*. Quebrada de las Pavas, 1,900 m., *Herzog 1834*.—Argentina: Ascochinga, Sierra de Córdoba, *Lorentz 374* (F, photo. and fragm. of type ex herb. Berol.). Prov. Córdoba, *Lossen 90* (F). Reported from many localities in Argentina, and also in Matto Grosso, Brazil.

The varieties listed in the synonymy are of minor importance, and scarcely worthy of nomenclatorial distinction. From Argentina the following vernacular names are reported for the species: "Tala falso," "guancar blanco," "alfiler," "alfilerillo," "coronillo blanco."

8. **Bougainvillea infesta** Griseb. Symb. Argent. 40. 1879.

A shrub about 2 m. high, unarmed or furnished with stout spreading spines 5–15 mm. long, the young branchlets densely pubescent, the older ones glabrate; leaves petiolate, elliptic to ovate or elliptic-lanceolate, mostly 2–4 cm. long, broadest at or below the middle, obtuse to acute, truncate to acute at the base, densely puberulent or tomentulose beneath; bracts greenish, about 2 cm. long and 11–13 mm. wide, rounded or subcordate at the base, very obtuse or rounded at the apex, densely pubescent; perianth 12–14 mm. long, densely pubescent or hirsute, the limb 5 mm. wide; stamens 5.

Bolivia: Villamontes, *Pflanz 2134* (F, W). Espía, head of Bopi River, 1,050 m., *Rusby 139* (W). The following collection is reported by Heimerl: Dry forest between Embarcación and Miraflores, *Herzog 1043*.—Argentina: Orán, *Lorentz & Hieronymus 415* (F, photo. of type ex herb. Berol.). Sierra de Calitegua, Dept. Ledesma,

750 m., *Venturi 5404* (F). Reported also from various other localities in Argentina.

Herzog gives the vernacular name as "palo mataco."

Bougainvillea Herzogiana Heimerl, Med. Rijks Herb. 27: 12. 1915.

The species was based on a sterile specimen from Monte Grande near Fortín Guarayus, Bolivia, *Herzog 127*. It is said to be closely related to *B. infesta*, but since it is based upon leaf characters alone, the status of the plant must remain uncertain until complete material has been collected.

8. COLIGNONIA Endl.

Plants often scandent, weak, shrubby or wholly herbaceous, sometimes with tuberous roots; leaves opposite or whorled, slender-petioled, broad, entire, those of the inflorescence often wholly or partly white; flowers very small, perfect, neither involucrate nor bracteate, umbellate; perianth minute, campanulate or funnelform, 3–5-parted, the tube 3–5-angled; stamens usually 5, the anthers didymous; style filiform, exserted; anthocarp ellipsoid to fusiform or obpyramidal, sometimes almost orbicular, with 3–5 wings or angles.

The genus consists of 10 species, confined to the Andean region of South America and Panama. The species not listed here are natives of Peru.

Perianth normally 5-parted; fruit 5-angled, not winged; leaves marked beneath with numerous raphids.

Perianth slender-stipitate; fruit fusiform.....1. *C. parviflora.*

Perianth not conspicuously stipitate; fruit broadly pyriform or almost globose.....2. *C. glomerata.*

Perianth usually 3-parted; fruit with normally 3 wings; leaves without conspicuous raphids.

Leaves densely rufous-tomentose beneath.....3. *C. rufopilosa.*

Leaves glabrous or nearly so beneath.

Leaf blades oblong-ovate to lance-ovate, narrowed to the apex. 4. *C. scandens.*

Leaf blades mostly orbicular or nearly so, broadly rounded at the apex.....5. *C. ovalifolia.*

1. **Colignonia parviflora** (HBK.) Endl. Gen. Pl. 311. 1837. *Abronia parviflora* HBK. Nov. Gen. & Sp. 2: 216. *pl. 128*. 1818. *Tricratus parviflorus* Spreng. Syst. Veg. 1: 536. 1825.

Plants chiefly herbaceous, glabrous throughout, the stems weak and often subscandent, 2–3 m. long, glabrous; leaves often verticillate, the slender petioles equaling or shorter than the blades; leaf blades rounded-ovate to almost orbicular, more or less unequal, 3–4.5 cm. long, broadly rounded at each end, the blades of the uppermost leaves often colored white; flowers white, arranged in very numerous small umbels, the pedicels 2–3 mm. long; perianth 3 mm. long, the lobes elliptic to obovate-oblong, rounded at the apex; anthocarp fusiform or fusiform-obpyramidal, 6–10 mm. long, 2.5–3 mm. wide, conspicuously 5-angled or almost winged.

Colombia: Andes of Popayán near Querchu, *Humboldt & Bonpland* (F, photo. of type ex herb. Berol.). Volcán de Cumbal, *Stübel 445* (F, fragm. ex herb. Berol.). Heimerl has reported also *Triana 995*. Azufral, *André 3254* (F).—Ecuador: La Rinconada, Prov. Carchi, 3,000 m., *Hitchcock 20943* (W). The species is recorded also from the mountains of Panama, but I doubt that the specimen is correctly labeled.

2. **Colignonia glomerata** Griseb. Goett. Abh. 19: 87. 1874. *C. glomerata* var. *typica* Heimerl, Denkschr. Akad. Wiss. Wien 70: 135. 1900. *C. glomerata* var. *boliviana* Heimerl, op. cit. 136. 1900.

Plants large and branched, herbaceous, often 2.5 m. high, nearly or quite glabrous, the coarse stems hollow; leaves very unequal, the petioles nearly as long as the blades; leaf blades varying from broadly ovate to ovate-deltoid, or the upper ones lance-ovate and often white, acutish to rounded at the apex, mostly 5–10 cm. long, thin, paler beneath; umbels about 8–12-flowered, long-pedunculate, the pedicels in anthesis 1–2 mm. long; perianth 2–3 mm. long, glabrous; anthocarp globose-turbinate to almost pyriform, 3–4 mm. long, 2–2.5 mm. wide, attenuate toward the base.

Argentina: Ciénaga, *Lorentz & Hieronymus 725* (F, photo. ex herb. Berol.). Siambon, *Lorentz & Hieronymus 894* (F, photo. ex herb. Berol.). Reported by Heimerl also from "Alisowäldern der Cuesta de Anfama in der Nähe der Ciénaga," *Lorentz 313, 754*.—Bolivia: Tunari, May, 1892, *Kuntze* (F). Yungas, *Bang 699* (F, W). Without locality, *Bang 1772* (F, W). Sorata, 3,000 m., *Rusby 2705* (F, W); in wet places, *Holway 523* (W). Heimerl reports also *Mandon 1007*.

Var. *boliviana* Heimerl was based upon *Bang 699* and several other collections. To the present writer it does not appear to be sufficiently distinct from the typical form to deserve the distinction of a varietal name.

3. **Colignonia rufopilosa** Kuntze, Rev. Gen. 3^2: 264. 1898; Heimerl, Denkschr. Akad. Wiss. Wien 70: 132. 1900.

Plants herbaceous or suffrutescent, 1–3 m. long, usually sprawling or clambering, the stout branches densely ferruginous-tomentose; leaves chiefly opposite, those of a pair subequal, those of the inflores-

cence often white, the slender petioles shorter than the blades; leaf blades ovate or ovate-elliptic, 3–8 cm. long, narrowed to an obtuse apex, or the uppermost leaves often acute, green and sparsely tomentulose above, paler beneath and densely rufous-tomentose; umbels numerous, 10–25-flowered, the pedicels glabrous or nearly so, capillary, 2–4 mm. long, or in fruit up to 5 mm. long; perianth white, 2.5–3 mm. long, glabrous; anthocarp glabrous, suborbicular, 5 mm. long and broad, rounded at the base, 3-winged.

Ecuador: Huigra, *Rose & Rose 22519* (W). Reported by Heimerl from the Andes of Quito, *Jameson 695*.—Bolivia: Río Juntas, 1,000–2,000 m., April, 1892, *Kuntze* (F, photo. of type ex herb. Berol.; W, type collection). Yungas de San Mateo, 2,800 m., *Steinbach 8490* (F). Yungas, *Bang 710* (F, W). Unduavi, 2,400 m., *Rusby 2706* (F, W); 3,200 m., *Buchtien 4736* (W); 3,100 m., *Buchtien 2993* (W). San Felipe, Sur Yungas, *Holway 612* (W). Heimerl reports also collections by Cuming and Bridges, without special locality. The species occurs in Peru.

Of all the species of the genus, this is the best-marked and the most easily recognized.

4. **Colignonia scandens** Benth. Pl. Hartw. 148. 1844.

Plants herbaceous or suffrutescent, erect or subscandent, the stems 1–2 m. long, glabrous or nearly so; leaves often subverticillate, the small ones of the inflorescence frequently white, those of a pair subequal, the petioles usually shorter than the blades but sometimes equaling them; leaf blades elliptic to rhombic-ovate or oblong-ovate, 2–6 cm. long, rounded or very obtuse at the apex, sometimes acute at the base, sparsely ferruginous-puberulent beneath along the veins when young, in age glabrous or nearly so; umbels commonly 8–12-flowered, the pedicels glabrous, filiform, 3–4 mm. long, or in age as much as 6 mm.; perianth green or greenish, 2.5–3 mm. long, glabrous, the lobes obovate-elliptic, obtuse or rounded at the apex; anthocarp suborbicular, 4–5 mm. long and broad, glabrous, rounded at the base, 3-winged.

Ecuador: Type from the mountains of Loja, *Hartweg 828*. Between San Lucas and Oña, Prov. Loja, 2,200–3,100 m., *Hitchcock 21558* (W). Loja, December 1, 1876, *André 4554* (F). Also in Peru.

5. **Colignonia ovalifolia** Heimerl, Denkschr. Akad. Wiss. Wien 70: 132. 1900.

Plants herbaceous or suffrutescent, erect or subscandent, sometimes 3 m. long, the stems sparsely and closely ferruginous-tomentulose on the younger parts but soon glabrous or practically so; leaves opposite or subverticillate, rather small, a few of the uppermost bractlike leaves white, the very slender petioles usually equaling or often much longer than the blades; leaf blades mostly rounded-ovate or suborbicular and 2–4 cm. long, broadly rounded at the base, rounded at the apex, thin, paler beneath, when young sparsely

ferruginous-puberulent along the veins but soon glabrous or nearly so; umbels 12–16-flowered, the slender pedicels glabrous, 3–6 mm. long; perianth white, 3 mm. long, glabrous; anthocarp suborbicular, 5–6 mm. long and broad, glabrous, rounded at the base, 3–4-winged.

Colombia: Edge of forest, Rosalito, Dept. Tolima, 2,800–3,100 m., *Pennell 2984* (F, W). Without locality, *Triana 294* (herb. Paris). Las Escaleretas, Moras Valley, Cauca, 2,500–3,000 m., *Pittier 1383* (F, W). Above Canaan, Mt. Puracé, El Cauca, 3,300–3,400 m., *Pennell & Killip 6515* (W). Reported by Heimerl from Páramo de Hervé, *Goudot.*—Ecuador: Type from the Andes of Quito, *Spruce 5130.* Camino de Chillogallo a San Juan, Prov. Pichincha, 3,000 m., *Firmin 490* (F). Locality uncertain, *Sodiro 128–6* (F, photo. and fragm. ex herb. Berol.). Western slope of Mt. Chimborazo, 3,000–3,400 m., *Rimbach 4* (F).

9. ALLIONIA L.

Prostrate annual or perennial herbs; leaves opposite, petiolate, those of a pair unequal, the blades entire or sinuate; flowers perfect, in axillary clusters of 3, each subtended by a broad green bract, the bracts cucullate, enclosing the fruit; perianth corolla-like, constricted above the ovary, the limb oblique, 4–5-lobed; stamens 4–7, the filaments unequal, exserted; anthocarp coriaceous, obovoid or oval, strongly compressed, 3-costate or cristate on the inner surface, the outer surface bearing 2 parallel longitudinal rows of stipitate glands, the thin margins dentate or entire, inflexed.

The genus is represented in South America by a single variable species. Two other species described from Mexico and the United States may be distinct, for they are separated on characters which, for the Nyctaginaceae, are fairly constant.

1. **Allionia incarnata** L. Syst. Nat. ed. 10. 890. 1759. *A. mendocina* Phil. Sert. Mendoc. Alt. 41. 1870. *Wedelia incarnata* Kuntze, Rev. Gen. 533. 1891. *A. puberula* Phil. Anal. Mus. Nac. Chile Bot. 1891: 71. 1891. *A. Jarae* Phil. op. cit. 72. 1891. *A. Bandurriae* Phil. Anal. Univ. Chile 41: 274. 1895. *Wedeliella incarnata* Cockerell, Torreya 9: 167. 1909.

Perennial from a slender or thick, woody root, the stems short or elongate, glandular-puberulent or viscid-villous; leaves on petioles 5–20 mm. long, the blades oval to deltoid-orbicular or oblong, 1–6 cm. long, subcordate or rounded and unequal at the base, rounded to acute at the apex, paler beneath, glandular-puberulent or viscid-villous; involucres numerous, on slender peduncles 5 cm. long or less; bracts obovate-orbicular, 5–8 mm. long, rounded or obtuse at the apex; perianth 7–15 mm. long, purple-red or rarely white; anthocarp 3–4.5 mm. long, pale brown or olive, the inner side 3-costate, the margins with 3–5 low broad teeth, or the teeth more numerous and slender, the margins rarely entire.

Venezuela: Type from Cumaná. Savannas of Lagunillas, Mérida, 1,000 m., *Jahn 664* (W). Barquisimeto, in the cactus formation, 600 m., *Pittier 6391* (W).—Bolivia: Bolivian Plateau, *Bang 928* (F, W). Río Tapacani, 3,000 m., March 19, 1892, *Kuntze* (F). Tarija, frequent in dry sandy places, *Fries 1130* (W).—Argentina: Pampas, January, 1892, *Kuntze* (F). Prov. Córdoba, *Lossen 175* (F).—Chile: Desert of Atacama, *Morong 1102* (F). Parca, Cordillera Quebrada de Quipisca, Prov. Tarapacá, 2,500 m., *Werdermann 1056* (F). Tarapacá, *Philippi* (F, photo. of type material of *A. Jarae*, ex herb. Berol.). Prov. Atacama, *Philippi* (F, photo. of type material of *A. Bandurriae*, ex herb. Berol.). Atacama, *Philippi* (F, photo. of type material of *A. puberula*, ex herb. Berol.). The species ranges in the drier regions northward to the southwestern United States.

The forms referred here are variable as to amount and quality of pubescence and toothing of the anthocarp wings, but it seems quite impractical to separate them into recognizable forms or varieties.

10. BOERHAAVIA L.

Annual or perennial herbs, sometimes somewhat frutescent and subscandent, the stems often with viscous areas in the internodes; leaves opposite, often unequal, petioled, the blades entire or sinuate; flowers perfect, small, variously arranged, bracteate, the bracts usually very small; perianth corolla-like, campanulate, nearly rotate, or funnelform, the limb shallowly 5-lobate; stamens 1–5, exserted or included, unequal; anthocarp cylindric to obovoid or obpyramidal, terete or 3–10-angulate, sometimes 3–5-winged, glabrous or pubescent, sometimes furnished with stipitate glands.

Fruit terete or 10-ribbed, with stipitate glands near the apex; plants large and often subscandent; perianth funnelform.

Perianth purple or purplish, 8–10 mm. long; anthocarp 6.5 mm. long and 2 mm. thick; stamens 3 ..... 1. *B. tuberosa.*

Perianth greenish yellow, 5–8 mm. long; anthocarp 7–13 mm. long and 1.5–2 mm. thick; stamens 2 ..... 2. *B. scandens.*

Fruit 3–5-angled or 3–5-winged, without stipitate glands; plants usually low, erect or procumbent; perianth campanulate to almost rotate.

Flowers in cymes; anthocarp truncate at the apex, glabrous; perianth white or pink; plants annual ..... 3. *B. erecta.*

Flowers in heads or glomerules; anthocarp not truncate at the apex, often pubescent; perianth usually dark red; plants perennial.

Branches of the inflorescence glabrous; flowers mostly in clusters of 2–4 ..... 4. *B. coccinea.*

Branches of the inflorescence puberulent or glandular-puberulent; flowers chiefly in many-flowered heads ..... 5. *B. caribaea.*

1. **Boerhaavia tuberosa** Lam. Ill. Gen. 1: 10. 1791. *B. excelsa* Willd. Phytogr. 1. 1794. *B. scandens* Choisy in DC. Prodr. 13²: 454. 1849, in part, not L. *B. litoralis* HBK. Nov. Gen. & Sp. 2: 216. 1818. *Commicarpus tuberosus* Standl. Contr. U. S. Nat. Herb. 18: 101. 1916.

Plants much branched, suberect or scandent, sometimes 2 m. long, glabrous except at the nodes, pale; leaves thick and fleshy, long-petiolate, the blades broadly ovate or deltoid-ovate, 3.5–5.5 cm. long, acutish to short-acuminate, often subcordate at the base, glabrous or nearly so; flowers umbellate, the umbels numerous, 4–7-flowered, the pedicels long and slender but stiff; perianth glabrous or sparsely hirtulous above; stamens exserted; anthocarp linear-clavate, truncate at the apex, bearing about 5 glands below the apex.

Ecuador: James Bay, Galápagos Islands, *Stewart 1447* (W); common in open woods at 255 m. Albemarle Island, abundant in open places on the lower parts of the island, *Stewart 1442* (W). Reported also from Charles, Indefatigable, and Chatham Islands. Occurring in Peru.

This species as well as *C. scandens* belongs to a peculiar group of the genus for which the writer has proposed generic rank, under the name *Commicarpus*. The writer is still of the belief that the genus is quite as good a one as are most of those segregated in the family, but is willing to suppress it in order to aid in reducing, to as great an extent as possible, the increasing number of genera. The genus certainly is quite as good a one as *Pisoniella*.

2. **Boerhaavia scandens** L. Sp. Pl. 3. 1753. *Commicarpus scandens* Standl. Contr. U. S. Nat. Herb. 12: 373. 1909.

Plants large and usually clambering over other plants, suffrutescent near the base, the branches pale, glabrous, obscurely puberulent about the nodes; leaves thick and fleshy, on petioles 1–2 cm. long, the blades broadly cordate-ovate to ovate-deltoid, 1.5–6.5 cm. long, deeply cordate to truncate at the base, acute or obtuse at the apex, slightly paler beneath, glabrous or when young obscurely puberulent; flowers umbellate, the slender pedicels 5–10 mm. long, glabrous; perianth glabrous or rarely puberulent; stamens exserted; anthocarp glabrous, bearing few or numerous glands irregularly disposed along the costae.

Colombia: Region of Santa Marta, near sea level, *H. H. Smith 571* (F, W).—Venezuela: Between Estanques and Puente Real, Mérida, 500 m., *Pittier 12839* (W). Sabanas de Lagunillas, Mérida, 1,000 m., *Jahn 663* (W). Ranging northward to the southern borders of the United States, and widely dispersed in the West Indies.

The plant is said to be called "pegapega" in Curaçao.

3. **Boerhaavia erecta** L. Sp. Pl. 3. 1753. *B. virgata* HBK. Nov. Gen. & Sp. 2: 215. 1817. *B. discolor* HBK. loc. cit.

Plants annual, erect or decumbent, 1 m. high or less, usually much branched at the base, the slender branches finely puberulent below, the middle internodes often with brown viscous bands, the upper ones glabrous or minutely puberulent; leaves slender-petiolate, the blades broadly ovate-rhombic or deltoid-ovate, varying to oval or oblong, 2–6 cm. long, truncate to rounded at the base, broadly rounded to obtuse or rarely acute at the apex, pale beneath and usually brown-punctate, glabrous or sparsely puberulent; flowers on pedicels 1–5 mm. long; perianth 1–1.5 mm. long, glabrous, sometimes glandular-punctate; stamens 2–3, exserted; anthocarp narrowly obpyramidal, 3–3.5 mm. long, 1–1.5 mm. wide, glabrous, 5-angled.

Venezuela: El Valle, Margarita Island, *Miller & Johnston 204* (F, W). Between Caracas and La Guaira, *Rose 21642* (W). Near La Guaira, *Otto 449* (W).—Colombia: Region of Santa Marta, 30 m., *H. H. Smith 1321* (F, W). Barranquilla, *Bro. Paul B-33* (W), *C-39* (W). In fields, Sevilla, Dept. Magdalena, *Salt S* (W). Hacienda de Coloncito, near Turbaco, Dept. Bolívar, *Killip & Smith 14378* (W). Cartagena, *Bro. Heriberto 408* (W). Girardot, Dept. Cundinamarca, 350–400 m., *Rusby & Pennell 84* (W).—Ecuador: Charles Island, Galápagos Islands, common to 180 m., *Stewart 1439* (F, W). Narborough Island, Galápagos, occasional in lava crevices, *Stewart 1441* (W). Tagus Cove, Albemarle Island, Galápagos, common in open sunny places in tufaceous soil on the lower parts, *Stewart 1440* (F, W). Distributed as a weed through most of tropical America, and extending to the southern United States.

The plant is one of the most abundant weeds of many parts of tropical America. *Boerhaavia virgata* was described from Quetepe and Cumaná, Venezuela, and *B. discolor* from Guayaquil, Ecuador.

4. **Boerhaavia coccinea** Mill. Gard. Dict. ed. 8. *Boerhaavia* No. 4. 1768. *B. paniculata* Rich. Act. Soc. Hist. Nat. Par. 1: 105. 1792. *B. adscendens* Willd. Sp. Pl. 1: 19. 1797. *B. decumbens* Vahl, Enum. Pl. 1: 284. 1804. *B. diffusa* var. *laxa* Kuntze, Rev. Gen. 533. 1891.

Plants perennial from an often fusiform, fleshy root, the stems few or numerous, ascending or procumbent, 1 m. long or less, minutely puberulent below or often sparsely villous, especially at the nodes, glabrous above; leaves petioled, somewhat fleshy, the blades rhombic-orbicular to rhombic-ovate or oval, 2–5.5 cm. long, subcordate to broadly rounded at the base, rounded or obtuse at the apex, pale beneath, not punctate, glabrous or obscurely puberulent, rarely villous along the veins; flowers subsessile in glomerules of 2–4 at the ends of filiform glabrous peduncles 3–10 mm. long; perianth 2 mm. broad, minutely glandular-puberulent; stamens 2, short-exserted; anthocarp narrowly obovoid, 3–4 mm. long, rounded at the apex, densely glandular-puberulent or glandular-pilose, 5-sulcate.

French Guiana: Without locality, *Mélinon* (F).—Surinam: Groningen, May 10, 1916, *Samuels 122* (F).—British Guiana:

Georgetown, sandy places, roadside, *Persaud 163* (F).—Venezuela: Ciudad Bolívar, 35 m., *Holt & Gehriger 23* (F). El Valle, Margarita Island, *Miller & Johnston 203* (F). La Rubiera near Calabozo, Guárico, *Grisol 7* (W). La Guaira, *Moritz 1143* (W). Cristóbal Colón, on hills, *Broadway 119* (W). In savannas, Santa Rosa de la Tierra, near Maracaibo, *Pittier 10687* (W). Barquisimeto, 400 m., *Saer 590* (F).—Colombia: Santa Rosa to Cisneros, Dept. El Valle, on banks, 250–350 m., *Killip 5377* (W). Region of Santa Marta, on seashore, *H. H. Smith 1323* (F, W). Cañabetal, Dept. Bolívar, 100 m., in sand along river, *Pennell 3876* (W). Near Bello, Antioquía, *Archer 229* (F).—Ecuador: Caraques Bay, *Anthony 97* (W). Huigra, *Rose & Rose 22626* (W).—Bolivia: Guanai to Tipuani, *Bang 1431* (F, W). Bolivian Plateau, *Bang 957* (F, W). Junction of rivers Beni and Madre de Dios, *Rusby 904* (F, W). Tarija, in campo arenoso, *Fries 1150* (W). Milluguaya, Nord-Yungas, 1,300 m., *Buchtien 4135* (W).—Paraguay: Central Paraguay, *Morong 93* (F). Cordillera de Altos, *Fiebrig 247* (F). Also in Peru, and widely distributed in tropical America.

This is a common weedy plant of tropical America, but in some regions, such as Central America, it is much less frequent than *B. erecta* or *B. caribaea*.

4a. **Boerhaavia coccinea** Mill., var. **leiocarpa** (Heimerl), comb. nov. *B. paniculata* f. *leiocarpa* Heimerl, Oesterr. Bot. Zeitschr. 56: 252. 1906. *B. paniculata* var. *guaranitica* Heimerl, loc. cit. 1906. *B. Friesii* Heimerl, op. cit. 253. 1906. *B. paniculata* var. *leiocarpa* Heimerl, Ann. Cons. Jard. Genève 17: 225. 1913.

Like the species, but the anthocarp glabrous.

Colombia: Region of Santa Marta, 75 m., *H. H. Smith 1320* (F, W).—Bolivia: Tarija, in rupibus siccis apricis, *Fries 1206* (W, type collection). Bermejo, *Fries 2315* (F, photo. and fragm. ex herb. Berol.).—Paraguay: Cordillera de Altos, *Fiebrig 465* (F), *465a* (F).—Uruguay: Cerrito, Dept. Montevideo, *Herter 61A* (F). Also in Peru and Argentina.

I do not find any important or essential difference between *Boerhaavia Friesii* and the forms referred by Heimerl to his varieties *leiocarpa* and *guaranitica*. They all agree in having a glabrous anthocarp, but otherwise they differ little if at all from *B. coccinea*. It may be that the lack of pubescence on the fruit is sufficient to give the form specific rank but this is purely a matter of personal opinion.

5. **Boerhaavia caribaea** Jacq. Obs. Bot. 4: 5. 1771. *B. polymorpha* Rich. Act. Soc. Hist. Nat. Par. 1: 185. 1792. *B. hirsuta* Willd. Phytog. 1: 1. 1794. *B. viscosa* Lag. & Rodr. Anal. Cienc. Nat. 4: 256. 1801. *B. glandulosa* Anderss. Svensk. Vet. Akad. Handl. 1853: 171. 1854. *B. diffusa* var. *hirsuta* Kuntze, Rev. Gen. 533. 1891. *B. diffusa* var. *viscosa* Heimerl, Beitr. Syst. Nyct. 27. 1897. *B. patula* Domb. ex Vahl, Enum. Pl. 1: 287. 1805.

Plants perennial, from a thick woody root, the stems decumbent or prostrate, below viscid-puberulent and often hirsute or villous, above densely glandular-puberulent or often merely puberulent and slightly viscid; leaves thick, petiolate, the blades suborbicular to oval or oblong, 1.5–5.5 cm. long, truncate to rounded at the base, broadly rounded or obtuse at the apex, paler beneath and sometimes brown-puncticulate, glabrous or often puberulent or densely villous or hirsute; flower heads axillary or usually in open cymes, the branches of the inflorescence puberulent or glandular-puberulent, the flowers sessile or short-pedicellate; perianth purplish red, 2 mm. broad, puberulent or glandular-puberulent; stamens 1–3, short-exserted; anthocarp narrowly obovoid, 2.5–3 mm. long, 5-sulcate, densely glandular-puberulent.

Venezuela: San Pablo de Mendoza, Trujillo, in fields, *Pittier 13311* (W). In cactus formation, Cabo Blanco, D. F., *Pittier 10239* (W). El Sombrero, Guárico, *Pittier 11457* (W). Macuto, *L. H. & E. Z. Bailey 1204* (W). La Trinidad de Maracay, Aragua, 440 m., *Pittier 5761* (W). La Guaira, *Moritz 1143* (F). Hacienda El Volcán, near Santa Lucía, Miranda, *Pittier 8248* (W). Valencia, Carabobo, in savannas, 400–800 m., *Pittier 9029* (W).—Colombia: Dagua, El Valle, 700–900 m., *Pennell 5643* (W). Barranquilla, *Bro. Paul C-26* (W); *Bro. Elias 236* (W). Río Frío, Dept. Magdalena, *Salt F* (W). Region of Santa Marta, 45 m., *H. H. Smith 1499* (F, W). Santa Rita, *André 4183* (W). Without locality (possibly from Ecuador), *Lehmann 4712* (W). Cartagena, *Bro. Heriberto 379* (W).—Ecuador: Durán, *Rose & Rose 23605* (W). Without locality, *Eggers 14928* (F). Milagro, Prov. Guayas, 50 m., *Hitchcock 20208* (W). Oil camp between Guayaquil and Salinas, Prov. Guayas, *Hitchcock 20009* (W). Caraques Bay, *Anthony & Tate 107* (W). Daphne Island, *Wheeler, Rose & Beebe 9* (W). North Indefatigable Island, Galápagos, *Snodgrass & Heller 670* (W). Charles Island, Galápagos, April 8, 1888, *Lee* (W); beach to 180 m., in light tufaceous soil, *Stewart 1452* (W). Hood Island, Galápagos, on hillsides at 75 m., *Stewart 1456* (W).—Bolivia: Cotaña am Ilimani, 2,400 m., *Buchtien 3169* (W). Also in Peru; generally distributed in tropical America.

This species is one of the most abundant weeds of waste and cultivated ground in the lowlands of most parts of tropical America. Through its wide range it varies greatly, at least as regards the amount and nature of the pubescence, but it seems impractical to recognize any well-defined varieties or forms.

The vernacular name "tripa de gallina" is reported from Colombia.

Boerhaavia glandulosa was described from the Galápagos Islands.

11. MIRABILIS L.

Perennial herbs, erect or procumbent, often viscid-pubescent, the branches commonly swollen at the nodes; leaves opposite, petiolate or sessile, the blades entire or undulate; flowers perfect, involucrate, the

involucre 1–several-flowered, 5-lobate, in fruit often accrescent and becoming almost rotate; perianth corolla-like, tubular to campanulate, often oblique, the limb 5-lobed, the perianth soon withering and deciduous; stamens 3–5, unequal, usually exserted; anthocarp coriaceous, smooth or 5-angled or 5-sulcate, often constricted at the base, mucilaginous when wet.

The genus as here treated includes *Oxybaphus* and several other groups that have been treated at one time or another as distinct. If only the species of North America are considered, such genera as *Oxybaphus*, *Quamoclidion*, and *Hesperonia* seem to be differentiated by good and constant characters; but, as so often happens, when extralimital species are taken into account, the characters supposed to separate the groups break down. It seems necessary, therefore, to follow Heimerl in considering all the plants of the group as representing a single genus, *Mirabilis*.

Perianth very large, 3–5.5 cm. long.....1. *M. Jalapa.*

Perianth small, less than 2 cm. long.

Anthocarp sometimes pubescent, constricted at the base, 5-angulate or 5-sulcate; involucre accrescent after anthesis.

Stems densely viscid-villous throughout; leaf blades thick, nearly all deeply cordate at the base; involucre strongly accrescent in fruit and with almost entire margin.....2. *M. viscosa.*

Stems glabrous or glabrate below; leaf blades thin, mostly truncate or only shallowly cordate at the base; involucre slightly accrescent in fruit and remaining deeply lobed.

3. *M. violacea.*

Anthocarp glabrous, not constricted at the base, terete; involucre scarcely at all accrescent after anthesis.

Leaves thin, the lower ones on long slender petioles and even the uppermost usually with conspicuous petioles, the blades mostly truncate or shallowly cordate at the base.

4. *M. prostrata.*

Leaves rather thick, the lower ones on comparatively short and thick petioles, the upper mostly sessile or nearly so, the blades mostly rounded to acute at the base..5. *M. expansa.*

1. **Mirabilis Jalapa** L. Sp. Pl. 177. 1753. *M. odorata* L. Cent. Pl. 1: 7. 1755. *M. dichotoma* L. Sp. Pl. ed. 2. 252. 1762.

A stout bushy-branched perennial 1 m. high or less, the branches glabrous, puberulent, or rarely short-villous; leaves slender-petiolate, the blades ovate-deltoid to lance-oblong, 5–14 cm. long, subcordate to rounded at the base, acute to acuminate at the apex, glabrous or

rarely puberulent, usually ciliate; flowers in dense clusters at the ends of the branches; involucre short-pedunculate or subsessile, 7–15 mm. long, glabrous, puberulent, or short-villous, the lobes linear-lanceolate to lance-ovate, longer than the tube, acute or acuminate; perianth 3–5.5 cm. long, purplish red or white, yellow, or variegated; stamens 5; anthocarp 7–9 mm. long, 5-angled, verrucose or rugose, dark brown or black, glabrous or puberulent.

British Guiana: Kamakusa, upper Mazaruni River, *De La Cruz 4182* (F). Hyde Park, Demerara, in 1922, *G. B. Warren* (F).—Venezuela: Caracas, *Rose 21626* (W).—Colombia: Region of Santa Marta, 30 m., *H. H. Smith 1324* (F).—Bolivia: Yungas, *Bang 480* (F). Chiquiacá, 1,000 m., *Fiebrig 2702* (F).—Paraguay: Central Paraguay, *Morong 622* (F).—Argentina: Prov. Córdoba, *Lossen 277* (F), *278* (F).

This species, the common four-o'clock or marvel of Peru, is well known to horticulturists, being cultivated commonly in most tropical and even in temperate regions. It is one of the plants most frequently seen in the gardens of the United States, and thrives in almost any kind of soil or under neglect. The very sweet-scented flowers open in late afternoon and close the following morning. There are endless color varieties, those in which the perianth is striped in two or more colors being especially striking.

Although the plant is doubtless a native of America, it is not known where it grew originally. At the present time it probably is not found anywhere in a truly wild state, although often it persists in waste ground about settlements, sometimes as an abundant weed. In these respects it is like numerous other American plants that are known only in a cultivated state. No doubt the four-o'clock has been in cultivation for hundreds of years, and it may well have originated in Mexico, whose inhabitants had a great love for flowers. In the older botanical works the plant is assumed to be a native of Peru, but the fact that its nearest relatives grow wild in Mexico, while none at all occur in Peru, points to its nativity in Mexico.

Among the vernacular names reported are the following: "Jazmín colorado" (Venezuela); "maravilla," "buenas tardes," "buenas noches," "Don Pedro de noche," "cuambu" (Argentina); "dengue" (Chile); "maravilha," "boa noite," "bonina," "purga de nabiça" (Brazil).

2. **Mirabilis viscosa** Cav. Icon. 1: 13. *pl. 19*. 1791. *Nyctago parviflora* Salisb. Prodr. 57. 1796. *Calyxhymenia viscosa* R. & P. Fl. Peruv. 1: 46. 1798. *Calymenia viscosa* Pers. Syn. Pl. 1: 36. 1805. *Vitmania viscosa* Turra ex Steud. Nom. Bot. 140, in syn. 1821. *Oxybaphus viscosus* L'Hér. ex Choisy in DC. Prodr. 13^2: 430. 1849. *Allionia viscosa* Kuntze, Rev. Gen. 533. 1891.

A coarse herb, 0.5–1.5 m. high or even larger, the stems sometimes as much as 5 cm. thick, the branches densely viscid-pilose; leaves rather thick, long-petiolate, the blades broadly cordate-ovate or ovate-deltoid, 3–10 cm. long, usually cordate and abruptly short-decurrent at the base and acute to acuminate at the apex, short-villous or puberulent beneath and often also on the upper surface, the leaves of the inflorescence reduced and bractlike; inflorescence large, openly paniculate, the branches chiefly opposite, densely viscid-villous; involucres at anthesis 3–5 mm. long, in fruit 15–25 mm. broad, densely viscid-pilose; flowers solitary or rarely 2–3 in the involucre, the perianth 8–20 mm. long, purplish red, pink, or white, sparsely pilose, the limb 15–25 mm. broad; stamens 3; anthocarp obovoid, 5 mm. long, glabrous, densely covered with large coarse tubercles.

Colombia: Open limestone slopes below Dagua, Dept. El Valle, 700–900 m., *Pennell 5652* (W).—Ecuador: Huigra, *Rose & Rose 22146* (W). Also in Peru and Mexico.

3. **Mirabilis violacea** (L.) Heimerl, Beitr. Syst. Nyctag. 23. 1897. *Allionia violacea* L. Syst. Nat. ed. 10. 890. 1759. *Oxybaphus violaceus* Choisy in DC. Prodr. 13²: 432. 1849. *O. violaceus* var. *parviflorus* Choisy, loc. cit. *Allionia craterimorpha* Rusby, Descr. N. Sp. S. Amer. Pl. 15. 1920.

Plants annual or perennial, much branched from the base, the slender branches usually procumbent, bifariously puberulent or glabrate, sometimes sparsely viscid-villosulous; leaves on long slender petioles, the blades broadly ovate-deltoid, rarely elongate-deltoid, 3–11 cm. long or larger, subcordate or truncate at the base, acuminate or long-acuminate at the apex, rarely obtuse, thin, bright green, sparsely puberulent or short-pilose or glabrate; inflorescence cymose, usually dense and congested, or in age open, often leafy, the very slender branches viscid-pilose; involucres 3 mm. long in anthesis, in fruit 5–6 mm. long, green, viscid-pilose, the lobes triangular-ovate, unequal, mostly acute or acuminate; perianth purplish red, 6–8 mm. long, viscid-pilose or glabrate; stamens usually 3; anthocarp obovoid, 3.5–4 mm. long, dark brown or blackish, short-pilose, sparsely tuberculate.

Venezuela: La Victoria, *Jahn 212* (W). Lower Catuche Wood above Caracas, 1,000–1,200 m., *Pittier 7203* (W), *7127* (W). La Trinidad de Maracay, Aragua, 440 m., *Pittier 5762* (W). Between Antimano and Las Adjuntas, D. F., *Pittier 12410* (W). Los Chorros, 900 m., *Eggers 13042* (W). Hacienda de las Cuadras near Caracas, *Eggers 13007* (W). Near Caracas, 900–1,150 m., *L. H. & E. Z. Bailey 713* (W).—Colombia: Near Bonda, 45 m., *H. H. Smith 569* (F, W, type collection of *Allionia craterimorpha*). Between Suratá and California, Santander, in thicket, 1,740–2,000 m., *Killip & Smith 16795* (W). California, Santander, open hillside, 2,200 m., *Killip & Smith 16855* (W).—Ecuador: Between Huigra and Naranjapata, Prov. Chimborazo, 600–1,200 m., *Hitchcock 20650* (W). Ambato, *Pachano 74* (W). Huigra, *Rose, Pachano & Rose 23878* (W). El Recreo,

January 30, 1897, *Eggers* (F). Ranging northward to southern Mexico.

The var. *parviflorus* was based on *Moritz 216* from Colombia. The following additional Venezuelan collections are reported by Knuth (Fl. Venez. 317. 1928): Palmar, D. F., 1,000 m., *Wagener*. San Mateo, D. F., 800 m., *Wagener*. Nueva Barcelona, Bermúdez, *Humboldt & Bonpland*.

4. **Mirabilis prostrata** (R. & P.) Heimerl in E. & P. Nat. Pfl. 3, Abth. 1b: 24. 1889. *Calyxhymenia prostrata* R. & P. Fl. Peruv. 1: 46. *pl. 75, f. c.* 1798. *Oxybaphus prostratus* Vahl, Enum. Pl. 2: 40. 1806. *O. micranthus* Choisy in DC. Prodr. 13²: 432. 1849. *Mirabilis micrantha* Heimerl in E. & P. Nat. Pfl. 3, Abth. 1b: 24. 1889. *M. prostrata* var. *pubigera* Heimerl, Bot. Jahrb. Engl. 34: Beibl. 78: 10. 1904. *Allionia micrantha* Molfino, Physis 7: 51. 1923.

Plants much branched, erect or procumbent, reported to be sometimes as much as 2 m. high, the slender branches puberulent, viscid-villosulous, or often glabrate, with elongate internodes; leaves slender-petioled, thin, the uppermost short-petioled, the blades ovate or ovate-deltoid, often elongate-deltoid, mostly 3–7 cm. long, commonly truncate or subcordate at the base, acute to long-acuminate, rarely obtuse at the apex, sparsely villosulous or puberulent or more often glabrate; inflorescence cymose-paniculate, usually large and open, often leafy-bracted; involucres 4–5 mm. long, narrow, densely viscid-villosulous, the lobes narrowly triangular, mostly acute, subequal, equaling or shorter than the tube; perianth purplish red or pink, 7–10 mm. long, sparsely viscid-villosulous; stamens 3, usually exserted but sometimes included; anthocarp obovoid, 3 mm. long, glabrous, fuscous, nearly smooth.

Ecuador: Huigra, 1,200 m., *Hitchcock 20312* (W); *Rose & Rose 22407* (W), *22411* (W), *22296* (W). In sepibus interandinis prope Riobamba, *Mille 19* (W). Type of *M. prostrata* var. *pubigera* from Quito, *Sodiro 128–1*.—Bolivia: La Paz, Camino a Obrajes, 3,550 m., *Buchtien 377* (F), *140* (W). Cotaña am Ilimani, 2,450 m., *Buchtien 3168* (F, W), *262* (F). Cochabamba, March, 1892, *Kuntze* (F); at 3,000 m., March 26, 1892, *Kuntze* (F). Without locality, 3,000 m., April, 1892, *Kuntze* (F). Tarija, *Fiebrig 2436* (F, fragm. ex herb. Berol.). Cochabamba, *Bang 1069* (F, W), *1070* (F, W). Near La Paz, 3,000 m., *Bang 36* (W); *Claude-Joseph 1131* (W); *Rusby 2868* (W). Near Yungas, 1,200 m., *Rusby 2688* (F, W).—Argentina: Quebrada de Choya, Prov. Catamarca, *Schickendantz* (F, photo. and fragm. ex herb. Berol.).—Chile: Valparaíso, *Stewart* (F). Also in Peru.

The species was described from Peru, and *O. micranthus* was based on *Bertero 848* from Quillota, Chile.

5. **Mirabilis expansa** (R. & P.), comb. nov. *Calyxhymenia expansa* R. & P. Fl. Peruv. 1: 45. *pl. 75, f. a.* 1798. *Oxybaphus expansus* Vahl, Enum. Pl. 2: 41. 1806. *Allionia expansa* Kuntze, Rev. Gen. 533. 1891.

A coarse herb, suberect or procumbent or even subscandent, the stems sometimes 2.5 m. long but usually much shorter, the branches rather stout, very sparsely puberulent or villosulous or practically glabrous, the internodes mostly longer than the leaves; leaves rather thick, the petioles stout and relatively short; leaf blades varying from ovate-rounded to rhombic-ovate, broadly ovate, elliptic, or oblong-ovate, mostly 2.5–5 cm. long, truncate to acute at the base, often abruptly decurrent, very rarely cordate, obtuse to rounded at the apex, the uppermost leaves sometimes acute, puberulent, pilosulous or glabrate; inflorescence cymose-paniculate, usually rather sparse, the involucres mostly in small dense clusters; involucre 1-flowered, 4–5 mm. long, not accrescent, densely viscid-villosulous, sometimes densely covered with short hairs tipped with red glands, the lobes ovate-triangular, obtuse or acute, much shorter than the tube; perianth red-purple, 6 mm. long, sparsely puberulent or glabrous; stamens 3, usually not exserted; anthocarp ellipsoid, 3 mm. long, obtuse at each end, dark olivaceous, glabrous, almost smooth.

Venezuela: Mucurubá, 2,500 m., on stream bank, *Gehriger 187* (F). —Ecuador: Alausí, Prov. Chimborazo, 2,500 m., *Hitchcock 20703* (W), *20702* (W). Ambato, *Pachano 34* (W). In fruticetis interandinis ad Cotocollao, *Mille 413* (W).—Chile: Valparaíso, November, 1924, *Behn* (F). Also in Peru, from which country the species was described.

The species is a somewhat variable one, and not sharply distinct from *M. prostrata*. The specimen from the isolated Venezuelan locality is remarkable for the abundant hairs with bright red glands at the tip covering the involucres and peduncles, but similar pubescence is found also in material from other regions. Some of the Ecuador specimens are noteworthy for their almost reniform, small leaves. Although they are appreciably different in appearance from Peruvian and other collections, they do not seem to be clearly separable from them.

THE CHENOPODIACEAE OF NORTHWESTERN SOUTH AMERICA

PAUL C. STANDLEY

The species of Chenopodiaceae occurring in northwestern South America are so few, and of so little general interest, that it is questionable whether it is worth while to publish an enumeration of them. The only genera, indeed, with any considerable number of species in the area under consideration are *Chenopodium* and *Atriplex*, and several of the representatives of the former group are widely dispersed weeds.

The region covered embraces Venezuela, Colombia, Ecuador, and Bolivia, treatment of the Peruvian Chenopodiaceae being reserved for publication elsewhere. It has been found necessary to describe but one new species, an *Atriplex*. While few further plants of this somewhat "weedy" family may be expected in northwestern South America, it would not be surprising if a few additions in *Atriplex* and *Chenopodium* should appear in later collections.

The present paper is based upon the material in the Herbarium of Field Museum, and upon that of the United States National Museum, lent for study through the courtesy of Dr. William R. Maxon and Mr. Ellsworth P. Killip.

KEY TO THE GENERA

Embryo spirally coiled. Flowers all axillary; leaves terete or semiterete, very fleshy and succulent.....1. *Suaeda*.

Embryo not spirally coiled.

Flowers in fleshy spikes or sunken in the joints of the stems; leaves much reduced and scalelike.

Flowers in conelike spikes, the bracts free and deciduous. 2. *Heterostachys*.

Flowers sunken in the joints of the stems, the bracts united and persistent.....3. *Salicornia*.

Flowers usually glomerate, or solitary in the axils; leaves usually well developed.

Flowers usually perfect, ebracteolate.....4. *Chenopodium*.

Flowers unisexual, the pistillate ones subtended by 2 bracteoles which enlarge in age and enclose the fruit.....5. *Atriplex*.

Besides the genera listed formally, there are cultivated in the region under consideration the beet, *Beta vulgaris* L., and spinach, *Spinacia oleracea* L.

1. SUAEDA Forsk.

Annuals or perennials, erect or prostrate, glabrous or pubescent, herbaceous or suffrutescent; leaves alternate, terete or semiterete, rarely flat, entire, fleshy; flowers minute, chiefly perfect, solitary or glomerate in the leaf axils; perianth fleshy, 5-lobed; stamens 5; fruit a compressed or depressed utricle, enclosed in the perianth; seed horizontal or erect, smooth or roughened.

1. **Suaeda foliosa** Moq. in DC. Prodr. 13²: 156. 1849.

Apparently perennial, glabrous or nearly so, much branched, the stout branches roughened by the persistent leaf bases of fallen leaves; leaves mostly 5–8 mm. long, glaucous, very thick and fleshy, obtuse or acutish, semiterete, glabrous; flowers minute, green, solitary or in clusters of 3.

The species occurs in Peru and Chile. The only report of the genus *Suaeda* from the countries here covered is the publication of *Suaeda fruticosa* var. *crassifolia* Moq. (in DC. Prodr. 13²: 157. 1849), which was based upon a specimen collected in Bolivia by D'Orbigny. No Bolivian material has been seen by the writer, but it seems probable that any *Suaeda* occurring there will prove to be *S. foliosa*, although there is a possibility that it might be the Argentine *S. divaricata* Moq.

2. HETEROSTACHYS Ung.-Sternb.

Tall erect much-branched shrubs with stiff woody branches; leaves minute, opposite or subopposite, free, suborbicular, obtuse, closely imbricate; flowers perfect, solitary in the axils of opposite deciduous bracts, the flower spikes resembling small cones; perianth orbicular, membranaceous, complanate, broadly winged on each side, 4-lobate; stamens 2; utricle compressed, oblong-obovoid; seed ellipsoid, compressed, smooth.

The genus consists of a single species.

1. **Heterostachys Ritteriana** (Moq.) Ung.-Sternb. Atti Congr. Bot. Firenze 332. 1876. *Halocnemum Ritterianum* Moq. Chenop. Enum. 109. 1840. *Halostachys Ritteriana* Moq. in DC. Prodr. 13²: 148. 1849. *Spirostachys Ritteriana* Ung.-Sternb. Vers. Syst. Salicorn. 100. 1866.

A slender, densely branched, glabrous shrub; leaves about 1.5 mm. long and broad, closely overlapping; flower spikes sessile or short-pedunculate, 4–12 mm. long, obtuse, many-flowered; bracts broader than long, concave, clasping, very obtuse.

Colombia: Wind-swept plains of Río Hacha, one-half mile back from the coast, February 6, 1914, *J. G. Sinclair* (W).—Venezuela: La Vela de Coro, *Curran & Haman 442* (W).—Argentina: Totoralejas, November, 1892, *Kuntze* (F). Also in Hispaniola.

3. SALICORNIA L.

Annuals or perennials, sometimes suffrutescent, fleshy, glabrous, with jointed branches, the joints dilated at the apex into a short sheath; flowers perfect or polygamous, immersed in groups of 3–7 on opposite sides of the joints, the flowering joints forming cylindric terminal spikes; perianth obpyramidal, fleshy, 3–4-dentate; stamens 1–2; fruit a minute utricle, included in the perianth; seed erect, compressed, minutely hairy.

1. **Salicornia fruticosa** L. Sp. Pl. ed. 2. 5. 1762. *S. peruviana* HBK. Nov. Gen. & Sp. 2: 193. 1818. *S. Gaudichaudiana* Moq. Chenop. Enum. 115. 1840. *S. biloba* Kunze ex Fenzl in Mart. Fl. Bras. 5^1: 158. 1864, as syn.

An erect or prostrate perennial, suffrutescent at the base, much branched, the secondary branches ascending or erect, usually branched, the joints mostly 1–2 cm. long; sheaths rounded or with acutish lobes; flower spikes about 2 cm. long and 3 mm. thick, the flowers in groups of 3; seed yellowish brown, covered with short conic hairs.

Venezuela: Paraguana Peninsula, *Curran & Haman* 557 (W).—Ecuador: Between Guayaquil and Salinas, Prov. Guayas, *Hitchcock 19996* in part (W; part of this number is *Batis maritima* L.).—Bolivia: Pazña, 4,000 m., salt-steppes, *Buchtien 1385* (W; material immature and imperfect and determination therefore uncertain).—Chile: Desert of Atacama, *Morong 1159* (F). Arauco, salt marsh, *Pennell 12931* (F). Ancud, Prov. Chiloe, moist sand in rock crevices on beach, *Pennell 12579* (F). Widely dispersed on seashores of both hemispheres.

4. CHENOPODIUM L.

Annual or perennial herbs, rarely suffrutescent, often strong-scented, usually either glandular or covered with a meal-like pubescence of small whitish inflated hairs; leaves alternate, mostly petiolate, entire to pinnatifid; flowers chiefly perfect, small and green, usually glomerate; perianth normally 5-lobate; stamens 5 or fewer; fruit an utricle, erect or depressed, the pericarp free from or adherent to the seed; seed horizontal or vertical.

The American species of the genus have been treated in detail by Aellen, Repert. Sp. Nov. 26: 31–64, 119–160. 1929. That author has given an excellent account of the synonymy of the American species, with citation of specimens available to him for study.

Seed vertical.....1. *C. macrospermum.*
Seed horizontal.

Embryo not completely encircling the endosperm; leaves and inflorescence bearing numerous glands.

Pericarp gland-dotted; flowers in spikes.....2. *C. ambrosioides.*

Pericarp not gland-dotted; inflorescence dichotomous, some of the flowers pediceled.....3. *C. incisum.*

Embryo completely encircling the endosperm; plants without glands.

Seed white or nearly so.....4. *C. quinoa.*

Seed black or blackish.

Leaves shining on the upper surface, green but sparsely farinose. Inflorescences chiefly axillary and rather few-flowered, lax.....5. *C. murale.*

Leaves dull on the upper surface.

Plants low, 50 cm. high or less, with spreading branches; leaves small, 2 cm. long and broad or less, shallowly or rather deeply 3-lobed.

Seed irregularly punctate.....6. *C. pallidicaule.*

Seed smooth or nearly so, not punctate..7. *C. carnosulum.*

Plants tall and erect; leaves commonly much more than 2 cm. long.

Leaves chiefly deltoid, entire except for the hastate lobes at the base, commonly obtuse, finely farinose, usually pale; seed scarcely 1 mm. broad.....8. *C. petiolare.*

Leaves mostly rhombic and sinuate-dentate; seed 1.3–1.8 mm. broad.

Mature seed deeply punctate; plants ill-scented. 9. *C. hircinum.*

Mature seed minutely puncticulate or almost smooth; plants without a distinctive odor...10. *C. album.*

1. **Chenopodium macrospermum** Hook. f., var. **halophilum** (Phil.), comb. nov. *C. halophilum* Phil. Anal. Univ. Chile 18: 67. 1861. *C. murale* var. *farinosum* Wats. Proc. Amer. Acad. 9: 97. 1874. *C. farinosum* Standl. N. Amer. Fl. 21: 28. 1916. *C. macrospermum* subsp. *halophilum* Aellen, Repert. Sp. Nov. 26: 42. 1929. *C. macrospermum* subsp. *halophilum* f. *subviride* Aellen, Repert. Sp. Nov. 26: 43. 1929. *C. macrospermum* subsp. *halophilum* f. *farinosum* Aellen, loc. cit. *C. macrospermum* subsp. *halophilum* f. *latifolium* Thellung & Aellen, loc. cit. *C. macrospermum* subsp. *halophilum* f. *angustius* Thellung & Aellen et f. *nanum* Aellen, op. cit. 44. 1929.

An annual, branched from the base, suberect or spreading, sometimes 50 cm. high but often much reduced, with branches only 2–4

cm. long; leaves petiolate, rhombic or deltoid-rhombic, 1–6 cm. long, green and glabrate on the upper surface, usually densely whitish-farinose beneath, sinuate-dentate to subentire; flowers spicate, the spikes axillary and forming narrow dense leafy terminal panicles; seed dark reddish brown, 1 mm. long.

Bolivia: Guaqui, Lake Titicaca, 3,820 m., *Buchtien 2828* (W). Near La Paz, 3,000 m., *Bang 199* (F, W).—Chile: Arauco, at sea level, salt marsh, *Pennell 12919* (F).—Argentina: General Roca, Río Negro, 250–360 m., *W. Fischer 276* (F).—Paraguay: Río Pilcomayo, *Morong 918* (F). Also in Mexico and southern California, and adventive at various places in the United States and in Europe. The typical form of the species occurs in the Falkland Islands.

The species is a variable one in stature and leaf form, but the forms to which names have been given seem to be of little significance. The plant has been confused by various authors with *C. rubrum* L. and *C. glaucum* L. In general appearance it suggests a large and overgrown plant of the latter species. Aellen lists the Chilean *Blitum salsum* Phil. as a synonym of var. *halophilum*.

2. **Chenopodium ambrosioides** L. Sp. Pl. 219. 1753. *C. anthelminticum* L. Sp. Pl. 220. 1753.

An ill-scented annual or perennial, erect or ascending, usually much less than 1 m. high, conspicuously glandular, commonly more or less villous or puberulent; lower leaves petiolate, narrow, sinuate-dentate or sinuate-pinnatifid, the upper ones mostly entire or nearly so; flowers densely glomerate, forming slender or stout, naked or leafy, often much elongate spikes.

Colombia: Mutiscua, Norte de Santander, 2,900 m., *Killip & Smith 19665* (F). Santa Marta, 750 m., *H. H. Smith 542* (F). Highlands of Popayán, 1,600–2,000 m., *Lehmann BT543* (F).—Bolivia: Buenavista, Dept. Santa Cruz, 500 m., *Steinbach 5135* (F). Hacienda Casana, Tipuani Valley, 1,400 m., *Buchtien 7281* (W). Yungas, *Bang 281* (F). La Paz, 3,400 m., *Buchtien 4137* (F).—Argentina: In distr. urb. Posadas, Misiones, *Lillieskold* (F). General Roca, Río Negro, 250–360 m., *W. Fischer 240* (F). Siambon, Sierra de Tucumán, *Hieronymus 763* (F). Cuesta del Cerro, Sierra Achala de Córdoba, *Hieronymus 533* (F). La Ciénaga, Sierra de Tucumán, *Lorentz & Hieronymus 718* (F). Prov. Córdoba, *Lossen 160* (F), *207* (F).—Chile: Desert of Atacama, *Morong 1156* (F).—Uruguay: Casavalle, Dept. Montevideo, *Herter 55a* (F). Widely distributed as a weed in tropical America; naturalized in the United States and in Europe.

Called "paico" in the Amazonian region of Peru. The name "baico," evidently a corruption or misspelling of *paico*, is recorded from Colombia by Killip, who reports the plant as a remedy for "tropical anemia." Its seeds are, of course, a well-known remedy for intestinal parasites.

2a. **Chenopodium ambrosioides** L., subsp. **chilense** (Schrad.) Aellen, Repert. Sp. Nov. 26: 36. 1929. *C. chilense* Schrad. Ind. Sem. Hort. Goett. 1832: 2. 1832. *C. vagans* Standl. N. Amer. Fl. 21: 26. 1916. *C. querciforme* Murr, Mag. Bot. Lap. 3: 1. 1904.

Similar to the species; leaves usually smaller and more deeply incised, even the uppermost deeply sinuate-lobate; spikes usually elongate, very dense, and naked or nearly so.

Bolivia: La Paz, 3,700 m., open stony banks, *Pennell 14258* (F); 3,000 m., *Bang 52* (F).—Chile: Arauco, at sea level, sandy knolls along salt marsh, *Pennell 12934* (F). Alto del Carmen, Vallenar, Prov. Atacama, 800 m., *Werdermann 155* (F). Reported from many localities in Chile; Santa Catharina, Brazil; naturalized in California.

3. **Chenopodium incisum** Poir. in Lam. Encycl. Suppl. 1: 392. 1811. *Teloxys Mandoni* Wats. Proc. Amer. Acad. 9: 91. 1874. *C. incisum* var. *Bangii* Murr, Bull. Herb. Boiss. II. 4: 991. 1904. *C. rigidum* Lingelsh. Repert. Sp. Nov. 7: 241. 1909.

An erect annual, strong-scented, 60 cm. high or less, simple or branched from the base, the branches sparsely puberulent or glabrate; leaves slender-petiolate, the blades deltoid-ovate to oblong, sinuate-pinnatifid or laciniate-pinnatifid, bearing numerous yellow glands beneath; inflorescence of numerous loosely few-flowered, axillary cymes; flowers sessile in the forks of the branches and solitary at the ends of the slender lateral branches, the pedicellate flowers usually abortive, their pedicels spinose; seed 0.5–0.8 mm. broad, dark brown.

Bolivia: La Paz, 3,500 m., *Buchtien 33* (F). Talca Chugiaguillo, *Bang 799* (F, W). La Paz, 3,000 m., *Bang 3* (W). Pazña, 4,200 m., *Buchtien 1383* (W). Cotaña am Ilimani, 3,450 m., *Buchtien 6305* (W). Cochabamba, *Bang 1004* (W; type collection of var. *Bangii*). La Paz, am Wege nach Obrajes, 3,500 m., *Buchtien 4562* (W). Valle, Prov. Cercado, Dept. Cochabamba, 2,750 m., *Steinbach 9710* (F). Also in Argentina and Peru, and ranging from Mexico to the southwestern United States.

Chenopodium rigidum was based upon Bolivian material. The type of *Teloxys Mandoni* is *Mandon 1026* from Bolivia.

4. **Chenopodium quinoa** Willd. Sp. Pl. 1: 1301. 1797. *C. purpurascens* Jacq., var. *punctulatum* Moq. in DC. Prodr. 13²: 67. 1849. *C. Nuttalliae* Safford, Journ. Wash. Acad. Sci. 8: 523. 1918. *C. quinoa* f. *purpureum* Aellen, Repert. Sp. Nov. 26: 124. 1929.

A coarse erect annual, often 1 m. high or more, sparsely and finely farinose, green or somewhat purplish (f. *purpureum*); leaves slender-petiolate, the blades large, broadly rhombic, sinuate-dentate, sometimes obscurely lobate at the base; inflorescence erect, stout and dense, compact, very leafy; seeds whitish, about 1.5 mm. broad.

Ecuador: Ambato, *Pachano 40* (W); *Rose & Rose 22355* (W).—Bolivia: La Paz, 3,750 m., *Buchtien 552* (F, W), *516* (F). Polo-Polo,

North Yungas, 1,100 m., *Buchtien 6304* (W). Yungas, *Bang 281* (W). La Paz, *Claude-Joseph 1172* (W). Also in Peru and Argentina.

"Quinoa" (Bolivia, Peru). The plant is cultivated commonly in the Andes for its edible seeds.

5. **Chenopodium murale** L. Sp. Pl. 219. 1753.

An erect or ascending annual, 60 cm. high or less, deep green but sparsely farinose, often much branched from the base; leaves slender-petiolate, the blades ovate or ovate-rhombic, 3–8 cm. long, sinuate-dentate; flowers in small glomerules, these arranged in lax or dense, chiefly axillary, mostly leafless cymes or panicles; seed 1.2–1.5 mm. broad, dull, finely puncticulate.

Curaçao: In 1917, *Curran & Haman 12* (W).—Colombia: Pamplona, Norte de Santander, 2,300 m., in field, *Killip & Smith 20744* (W). Mutiscua, Norte de Santander, 2,900 m., *Killip & Smith 19664* (W).—Venezuela: Caracas, 900 m., *Bailey 19* (W); "a common weed." Between Antímano and Las Adjuntas, Distrito Federal, *Pittier 12263* (W). Timotes, Mérida, 2,000 m., waste places, *Pittier 12691* (W). El Colorado, Tacagua Valley, Distrito Federal, *Pittier 11102* (W). Petare, Miranda, 800 m., *Pittier 9691* (W). Without locality, *Curran & Haman 735* (W).—Ecuador: Ambato, *Pachano 23* (W).—Bolivia: Cotaña, near Ilimani, 2,450 m., *Buchtien 3161* (W).—Chile: Coquimbo, 20 m., *Werdermann 129* (F). Desert of Atacama, *Morong 1155* (F).—Argentina: Córdoba, October 10, 1877, *Hieronymus* (F).—Brazil: Tijuca, Prov. Rio de Janeiro, *Glaziou 9566* (F). A native of Europe and other parts of the Old World, but widely naturalized as a weed in temperate and tropical regions of the Americas.

The vernacular name is reported from Curaçao as "picante sjimaron."

6. **Chenopodium pallidicaule** Aellen, Repert. Sp. Nov. 26: 126. 1929.

An erect or spreading annual, 60 cm. high or less, branched from the base, with pale stems, sparsely farinose; leaves slender-petiolate, the blades small, 1–2 cm. long and broad, trilobate, the lobes entire or nearly so, the blades of the uppermost leaves sagittate or entire; flower spikes short and dense, usually shorter than the leaves; seed dark brown, minutely and irregularly punctate.

Bolivia: Comanche, 4,000 m., *Buchtien 6296* (W). Also in the mountains of Peru.

7. **Chenopodium carnosulum** Moq. in DC. Prodr. 13^2: 64. 1849.

An ascending or spreading, much-branched annual, 30 cm. high or less, sparsely farinose when young, becoming glabrate; leaves petiolate, the blades mostly 1 cm. long or less, entire or shallowly

trilobate, thick and fleshy; flowers in small dense axillary glomerules shorter than the leaves; seed 1 mm. broad, nearly black.

Ecuador: Ambato, 2,600 m., *Hitchcock 21730* (W).—Bolivia: Uyuni, 3,700 m., *Asplund 6295* (W). La Paz, *Claude-Joseph 1115* (W). Also in Chile, Argentina, and southern Mexico.

8. **Chenopodium petiolare** HBK. Nov. Gen. & Sp. 2: 191. 1818. *C. paniculatum* Hook. Bot. Misc. 2: 237. 1831. *C. sparsiflorum* Phil. Anal. Univ. Chile 91: 419. 1895. *C. bolivianum* Murr, Mag. Bot. Lap. 1: 359. 1902. *C. Collae* Phil. ex Aellen, Repert. Sp. Nov. 26: 148. 1929, as syn. *C. parvulum* Phil. ex Aellen, loc. cit., as syn. *C. petiolare* f. *incanum* Aellen, Repert. Sp. Nov. 26: 150. 1929. *C. petiolare* f. *hastatum* Aellen, loc. cit. *C. petiolare* f. *scutatum* Aellen, op. cit. 151. 1929. *C. petiolare* f. *trilobum* Aellen, loc. cit.

Plants erect or spreading, sometimes 1 m. high, slender and much branched, pale, the branches rather densely and finely farinose; leaves slender-petiolate, the blades thin, densely farinose or rarely green and glabrate, very variable in outline, small, commonly more or less deltoid and distinctly hastate-lobate at the base, otherwise entire or remotely sinuate-dentate; inflorescence large and open, much branched, the spikes slender and much interrupted, naked or with few reduced leaves; seed black or blackish.

Ecuador: Type collected at Riobamba by *Humboldt & Bonpland.* Ambato, *Rose & Rose 22387* (W); *Tate 537* (W).—Bolivia: La Paz, 3,000 m., *Bang 56* (W; type collection of *C. bolivianum*); *Rose 18905* (W); at 3,500 m., roadside, *Pennell 14214* (F, W); at 3,500 m., *Buchtien 2827* (W); at 4,000 m., *Claude-Joseph 1173* (W). Without locality, *Bang 2897* (W). La Paz, 3,800 m., sunny slopes, *Buchtien 144* (W). Pazña, 4,100 m., among rocks, *Buchtien 1384* (W). Cotaña am Ilimani, 2,450 m., *Buchtien 227* (F), *2827* (W).—Chile: Viña del Mar, August 3, 1930, *Behn* (F). Tacna, 650 m., *Werdermann 733* (F). Desert of Atacama, *Morong 1230* (F). La Serena, Prov. Coquimbo, 20 m., *Werdermann 374* (F). Also in Peru.

The species has been reported from Bolivia as *C. Fremonti* Wats. and as *C. Fremonti* var. *incanum.* The forms named by Aellen are based upon leaf variations of slight systematic importance. Brother Claude-Joseph reports from La Paz as the Aymara name "cañagira."

9. **Chenopodium hircinum** Schrad. Ind. Sem. Hort. Goett. 1833: 2. 1833. *C. quinoa* var. *orbicans* Murr, Mag. Bot. Lap. 3: 37. 1904. *C. hircinum* subsp. *eu-hircinum* Aellen, Repert. Sp. Nov. 26: 120. 1929. *C. hircinum* subsp. *eu-hircinum* var. *typicum* Ludwig & Aellen, op. cit. 121. 1929. *C. hircinum* subsp. *eu-hircinum* var. *rhombicum* Aellen, op. cit. 122. 1929. *C. hircinum* subsp. *Milleanum* Aellen, loc. cit.

Plants annual, tall and coarse, often 1 m. high or more, erect, the pale stems more or less striate; leaves long-petiolate, large, broadly rhombic, coarsely sinuate-dentate and often shallowly trilobate,

green but sparsely and minutely farinose; inflorescence very dense, narrow, leafy, the branches short and erect or ascending.

Colombia: Eastern paramos of Guasca, toward Gachetá, *Aristeguieta-Joseph* in 1921 (W). Reported by Aellen from the Río Magdalena, *Stübel 476*.—Ecuador: Turubamba, Prov. Pichincha, 2,800 m., *Firmín 228* (W). Type of subsp. *Milleanum* from Riobamba, *Mille 6a*.—Bolivia: La Paz, *Bang 61* (F, W). Also in Peru, Chile, Argentina, Paraguay, and Uruguay.

The local name is reported from Ecuador as "sacha-quinua."

10. **Chenopodium album** L. Sp. Pl. 219. 1753.

An erect annual 1–2 m. high, usually much branched, pale green and finely farinose; leaves petiolate, the blades broadly rhombic to lanceolate, often shallowly trilobate, sinuate-dentate; inflorescence large and open or small and condensed; seed 1.3–1.5 mm. broad, nearly smooth, black and shining.

Ecuador: Reported by Aellen (Repert. Sp. Nov. 26: 129. 1929) from Ambato, *Pachano 38*. A native of the Old World, but extensively naturalized in North America. Reported in South America also from Chile and Brazil.

5. ATRIPLEX L.

Shrubs or herbs, more or less furfuraceous, farinose, or canescent with inflated hairs; leaves alternate or opposite; flowers monoecious or dioecious, usually glomerate, the glomerules axillary or disposed in solitary or panicled spikes; staminate perianth 3–5-parted; stamens 3–5; pistillate flowers bibracteolate, the bractlets accrescent, free or united, enclosing the fruit, the perianth usually none; seed erect or inverted, rarely horizontal.

In the countries of South America covered in the present paper there are few species of *Atriplex*, but in Argentina and Chile the genus is amply represented, although not so extensively as in western North America.

Leaves sessile, cordate at the base.....1. *A. imbricata.*

Leaves petiolate or, if subsessile, acute at the base.

Leaf blades rhombic or broadly ovate, broadest near the base, undulate-lobate, long-petiolate; a tall shrub, 1–2 m. high.
2. *A. Rusbyi.*

Leaf blades oblong to elliptic or obovate, broadest at or above the middle, entire or dentate, the petiole usually short and not sharply differentiated from the blade; herbs or low shrubs.

Fruiting bracts not crested or tuberculate dorsally.

United portion of the bracts short-tubular, abruptly dilated into the free portion.....3. *A. oestophora.*

United portion of the bracts broadly obovoid, gradually expanded into the free portion.....4. *A. Asplundii.*

Fruiting bracts cristate or tuberculate dorsally.

Plants coarse and large, procumbent or ascending; leaves mostly 10–15 mm. long, often dentate...5. *A. pentandra.*

Plants small, prostrate, forming dense mats; leaves chiefly 4–7 mm. long, entire.....6. *A. Herzogii.*

1. **Atriplex imbricata** (Moq.) D. Dietr. Syn. Pl. 5: 536. 1852. *Obione imbricata* Moq. in DC. Prodr. 13²: 108. 1849.

A low shrub with stout pale branches, densely furfuraceous-canescent throughout; leaves thick, sessile, broadly deltoid-cordate, as much as 1 cm. long but usually much smaller, obtuse or acutish, entire; fruiting bracts axillary, about 2 mm. long, densely tuberculate dorsally.

Bolivia: Chiguana, 3,700 m., *Asplund 6297* (W). Uyuni, 3,700 m., *Asplund 6298* (W). Type collected in Bolivia by D'Orbigny.

The two collections cited do not agree perfectly with the original description, although they are the only specimens examined that can possibly represent the species. Moquin describes the leaves as only 2–3 mm. long. The two Asplund collections show rather young branches with decidedly larger leaves, but it may well be that mature branches of the same plants would have minute leaves.

The specimens cited above evidently are close to *Atriplex axillaris* Phil., a Chilean species, and also to *A. microphylla* Phil., of the same country. The specimens of *A. microphylla* that I have seen agree perfectly with the original description of *Obione imbricata.*

2. **Atriplex Rusbyi** Britton, Mem. Torrey Club 4: 250. 1895.

A stout shrub 1–2 m. high, pale and densely furfuraceous throughout; leaves thick, petiolate, the blades mostly rhombic or deltoid and 2–3.5 cm. long, short-decurrent to truncate at the base, obtuse, coarsely undulate-lobate or undulate, often crispate; flowers monoecious, the staminate spikes axillary or forming terminal panicles; fruiting bracts broadly flabelliform, 4–5 mm. long and somewhat broader, obscurely dentate on the free margin, smooth or short-tuberculate dorsally near the base.

Bolivia: Near La Paz, 3,000 m., *Bang 181* (F, W, type collection), *134* (W); 3,750 m., *Buchtien 575* (F, W). Huaricana, 2,800 m., alkaline soil, *Buchtien 145* (W). La Granja, 2,600 m., *Julio 139* (W).

3. **Atriplex oestophora** Blake, Contr. Gray Herb. 53: 32. 1918.

Described as a shrub 60 cm. high, but probably merely suffrutescent or herbaceous, pale and minutely furfuraceous throughout, copiously branched; leaves subsessile, obovate or oblong-obovate,

1.5–3 cm. long, entire, retuse at the apex, attenuate to the base; flowers monoecious; bracts united to the middle, 4–5 mm. long, the free portion broadly deltoid, obtuse, entire, 4–5 mm. wide.

Venezuela: Vela de Coro, *Curran & Haman 451* (W, type collection).

4. **Atriplex Asplundii**, sp. nov.—Herba perennis e radice lignoso crasso, ramis gracilibus 10–25 cm. longis subteretibus dense lepidoto-furfuraceis simplicibus vel parce ramosis, internodiis foliis brevioribus; folia alterna breviter petiolata parva, petiolo crassiusculo 2–4 mm. longo; lamina ovalis vel rotundata, interdum ovato-ovalis, 10–17 mm. longa, 5–14 mm. lata, apice rotundata, basi abrupte contracta et breviter decurrens, integra, crassiuscula, utrinque canescens, dense minute lepidoto-furfuracea; flores monoeci, masculis cum femineis intermixtis in glomerulis parvis axillaribus; calyx floris masculi 5-fidus, laciniis oblongis obtusis, antheris exsertis luteis; bracteae fructiferae axillares sessiles viridescentes minute furfuraceae late rhombeae c. 2 mm. longae et paullo latiores, integrae vel supra remote obscure tridenticulatae, dorso inappendiculatae, basi late rotundato-cuneatae.—Bolivia: Ulloma, alt. 4,000 m., February 26, 1921, *E. Asplund 6295* (U. S. Nat. Herb. 1,157,661, type).

5. **Atriplex pentandra** (Jacq.) Standl. N. Amer. Fl. 21: 54. 1916. *Axyris pentandra* Jacq. Sel. Stirp. Amer. 244. 1763. *Atriplex cristata* Humb. & Bonpl. ex Willd. Sp. Pl. 4: 959. 1806. *Obione cristata* Moq. Chenop. Enum. 73. 1840.

An annual or perennial, sometimes suffrutescent at the base, much branched, pale and minutely furfuraceous throughout; leaves alternate, subsessile, the blades oblong to obovate, 1–3 cm. long, rounded to acute at the apex, attenuate to the base, the lower leaves usually dentate but the upper often entire; flowers monoecious, the staminate in short dense inconspicuous terminal spikes, the pistillate fascicled in the upper leaf axils; fruiting bracts sessile, broadly cuneate-orbicular, 3 mm. long and usually somewhat broader, dentate, much thickened at maturity, dorsally densely cristate or muricate.

Venezuela: Type from Cumaná, *Humboldt & Bonpland.* Cabo Blanco, Distrito Federal, trailing on beach, *Pittier 12424* (F, W); *10322* (W). Without locality, *Curran & Haman 1248* (W).—Curaçao: Beaches and lagoons, *Curran & Haman 74* (W). Also in the West Indies and Florida.

The species has been reported vaguely from Colombia, but I have seen no specimens from that country, where it may well be expected to occur. Reports of the occurrence of this species farther southward in South America are based upon incorrect determinations.

6. **Atriplex Herzogii**, nom. nov. *A. serpyllifolia* Herzog, Med. Rijks Herb. 27: 11. 1915, non Bunge, 1877. *A. cristata* Humb. &

Bonpl., var. *pulvinata* Kuntze, Rev. Gen. 3²: 266. 1898. *A. cristata* var. *depauperata* Kuntze, loc. cit.

A perennial from a thick woody root, much branched from the base, the stems prostrate and forming dense mats, 10–40 cm. long, the whole plant pale and minutely furfuraceous or sometimes greenish; leaves very numerous, minute or small, alternate, subsessile, oblong to obovate, usually 4–7 mm. long but often somewhat larger, obtuse or rounded at the apex; flowers monoecious, the staminate glomerules small, terminal, solitary or short-spicate, inconspicuous, the pistillate flowers solitary or fasciculate in the leaf axils; fruiting bracts cuneate-orbicular, about 2 mm. long and often slightly broader, obscurely dentate, usually densely tuberculate dorsally.

Bolivia: Type from dry cliffs of Cerro de Oruro, at 3,800 m., *Herzog 2520*. Oruro, 4,000 m., March 14, 1894, *Kuntze* (F, type collection of var. *pulvinata*). La Paz, 3,750 m., *Buchtien 514* (F, W). Obrajes, La Paz, 3,300 m., *Buchtien 5303* (W). La Paz, 3,000 m., *Bang 84* (W). Viacha, 3,900 m., *Asplund 6302* (W). Chiguana, 3,700 m., *Asplund 6301* (W). Uyuni, 3,700 m., *Asplund 6300* (W), *6299* (W). Also in Peru.

It is possible that more than one species is represented by the specimens listed, which exhibit some variation. I have seen no specimen of var. *depauperata*, based upon material collected by Kuntze at Cochabamba, but presumably it is a synonym or form of *A. Herzogii*. Kuntze reports also a var. *parvifolia* of *A. cristata*, which he collected at Carcaje, at an elevation of 3,000 m. Presumably it also is referable here.